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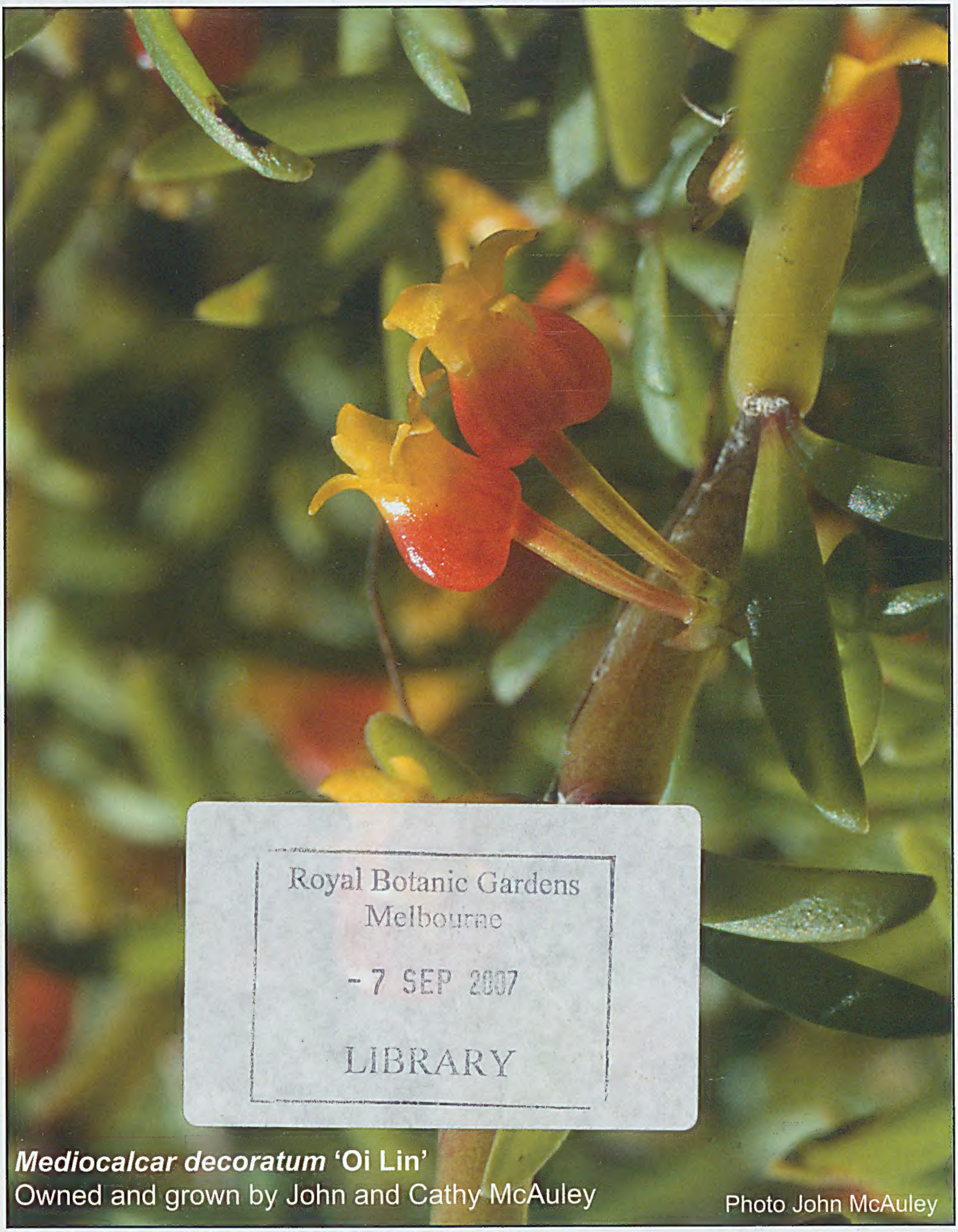

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Mediocalcar decoratum **'Oi Lin'**
Owned and grown by John and Cathy McAuley

Photo John McAuley

The Orchadian

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Editorial

Shortly after the June issue went out I received two papers which were a little different. One from Colin Bower on the *Chiloglottis* alliance and the insects that pollinate them. A great article explaining the relationship between the two and some great images of the insects pollinating the flowers. The second comes from Kevin Mills, who is studying and researching the flora of Norfolk Island and in his research came across some interesting information on an orchid not usually associated with this island.

David Jones has describes two new species of *Oligochaetochilus* and Paul Ormerod describes four new species of *Dendrobium*, Section Biloba, from New Guinea. Alan Stephenson updates us on *Calochilus pulchellus*, an orchid he is involved with in his local area.

Jessica Soanes, a Phd student from Perth, writes on the work being done in Kings Park and Botanic Gardens with Australian orchid seed storage. The project, supported by the Australian Orchid Foundation, looks at the best conditions to store seed for the future and for long term conservation. Jessica is also looking for growers to donate seed of Australian orchid species so if you can help contact her for details on where and how to donate.

Two well known orchid identities, Walter T. Upton, our Patron and Everett Foster from Geelong Group received OAM's in the recent Queens Birthday Honours List, congratulations gentlemen and congratulations to Geelong Group who recently celebrated their 20th Year.

Peter Dowling received this years prize for the most popular article over the past 4 issues, for his article on *Dendrobium* Kayla. So if you would like to have a go at the prize start writing!! (I'm need lots more material).

Peter

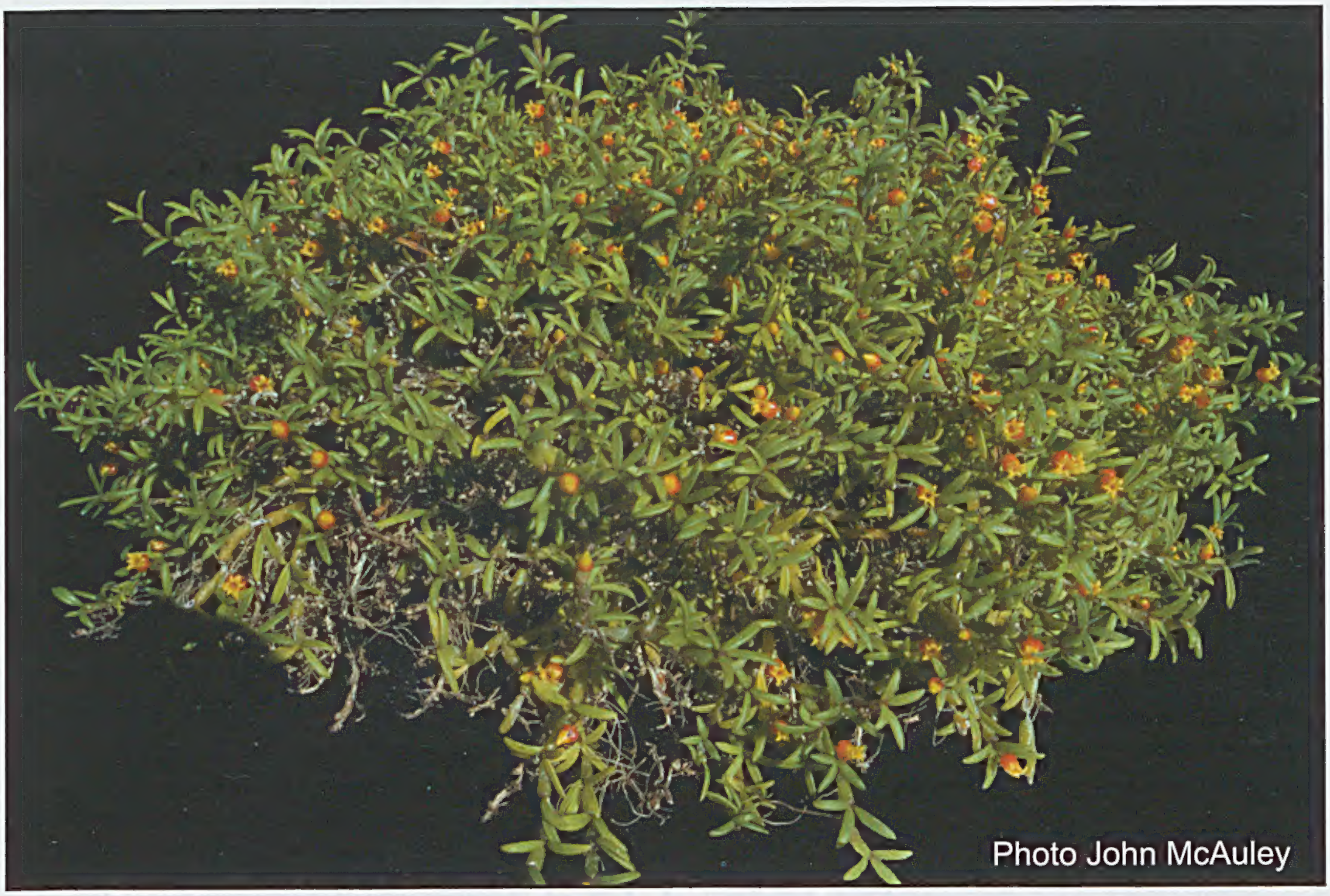
Walter Thomas Upton OAM

I would like to take this opportunity to congratulate on behalf of all ANOS members, our patron, Walter T. Upton who was in the last Queens Birthday Honours List awarded with the Order of Australia Medal.

Walter Upton is one of the every few foundation members of ANOS that are still actively involved in the Orchid World. He has served ANOS in so many ways; holding down positions as councillor not to mention his terms as President, Editor, as an active AOC judge it was decided that natives needed to be judged as natives not exotics so he helped ANOS set judging standards by which Native Orchids were to be judged. On the 1st of May 1978 he was to become one of the first ANOS judges; then with help from others introduction of judging classes began. The list just goes on. Books, Hybrids, Breeding. But most of all he passes on to us his knowledge and love of all orchids.

I am sure the whole orchid fraternity also extend to him their good wishes.

Congratulation, Walter T. Upton AOM
(*Another Ordinary Man*)
Graham Slater, Pesident



Mediocalcar decoratum 'Oi Lin'
Awarded an ACC by ANOS, 16th July, 2007.
Awarded an AM NSW/AOC for culture 15th July 2007.

***Mediocalcar decoratum* 'Oi Lin'** Schuit.
Owned and grown by John and Cathy McAuley

Mediocalcar decoratum is a native of Papua New Guinea and West Papua (formerly West Irian). It grows at elevations between 900 m to 2500 m in transitional montane forest as an epiphyte. However there have been unconfirmed reports of it growing as high as 3200 m. It is considered a cool grower that likes a bit of shade. Despite its succulent appearance, it does not tolerate drying so must be kept moist. It is a mat forming species which grows readily. It is often wrongly named *Mediocalcar pygmaeum* which is a different species. I grow my specimen in a shade house of 50% shade cloth. The roof, west and south sides are also covered with a waterproof plastic greenhouse cloth. The plant is situated close to the north wall so gets a little more light in winter than summer. It is watered approximatly three times a week in summer and once a week in winter, and fertilised with all the other orchids with either Merrifert, Excel or Blossom Booster. It grows in (or should I say on?) a bark & perlite mix in a terra-cotta shallow saucer which it has long since out-grown. In reality the plant is now growing on itself as it can be lifted clear of the saucer. My specimen plant has 744 flowers open all at once this year. The first person to collect this species was probably C. E. Carr in 1935. Unfortunately he died soon afterwards otherwise he would undoubtedly have described it himself. The RHS recognises 17 *Mediocalcar* species and 5 sub-species. Other *Mediocalcar* species tend to be climbing or straggling, rather than mat forming. Personally I find the *Mediocalcar* fascinating orchids and consider privileged to have a few different species, but would like to get more.

John McAuley

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An overlooked specimen of *Nematoceras* (*Corybas*) from Norfolk Island.

Kevin Mills#
114 North Curramore Road, Jamberoo, NSW 2533.

The Norfolk Island Group is composed of several small remote oceanic islands in the southwest Pacific, about 700 kilometres northwest of New Zealand and 1,500 kilometres east of Australia. At 29° south the islands are at the same latitude as Coffs Harbour on the east coast of Australia, and are regarded as subtropical. The total area of the islands is about 3,655 hectares. The islands have been well visited by many prominent botanists, e.g. Ferdinand Bauer, Allan Cunningham and Joseph Maiden, and the flora is well known (Mills 2007).

The islands are poor in terrestrial orchids; of the ten known indigenous species of orchid, seven are epiphytic and three are terrestrial. The 1994 Flora published as part of the *Flora of Australia* series (Green 1994) includes two species of terrestrial orchid considered to be indigenous to the Norfolk Island Group, namely *Microtis unifolia* and *Tropidia viridifusca*. The third species, *Thelymitra longifolia*, gathered in 1998, is documented by de Lange *et al.* (2005) who "suggest that it might be a recent natural addition to the indigenous flora of Norfolk". None of the terrestrial orchids is endemic to Norfolk, although four of the epiphytic species are only found there.

While researching the flora of Norfolk Island, particularly the history of botanical investigation since its European discovery in 1774, I came upon an overlooked orchid specimen from the island. The existence of the record and the possibility of an extant specimen come from a passage in a letter to Ferdinand von Mueller, long time Government Botanist and Director of the Melbourne Botanical Gardens, from a New Zealand botanist, Thomas Kirk, dated 8 June 1894 (Home, *et al.* 2006). The following is the full passage from the letter:

> "Did I mention that amongst some scraps of Norfolk Island plants collected for me by Miss Gertrude Purchas during a short visit is a solitary specn of *Corysanthes rivurlaris* [sic] a most interesting find – most of the other plants were of little interest – a large form of *Lobelia anceps* – *Samolus repens. Gnaphalium luteo-album* & the like."

Thomas Kirk (England 1828-1898 New Zealand) was the most prominent botanist in New Zealand in his time. Kirk held several positions in places of higher learning and was one-time curator of the Auckland Museum and conservator of state forests. He published extensively on the flora of New Zealand and surrounding islands, but apparently never visited Norfolk Island.

Following up on this information, I discovered that the *Corysanthes* specimen did indeed still exist and was in the Kirk Herbarium collection in the Museum of New Zealand Te Papa Tongarewa at Wellington. In response to my inquiry, the Museum replied that "there is a single specimen in the Kirk herbarium...labelled *Corysanthes rivularis* (in Kirk's handwriting) collected by Miss G. Purchas from Norfolk Island."

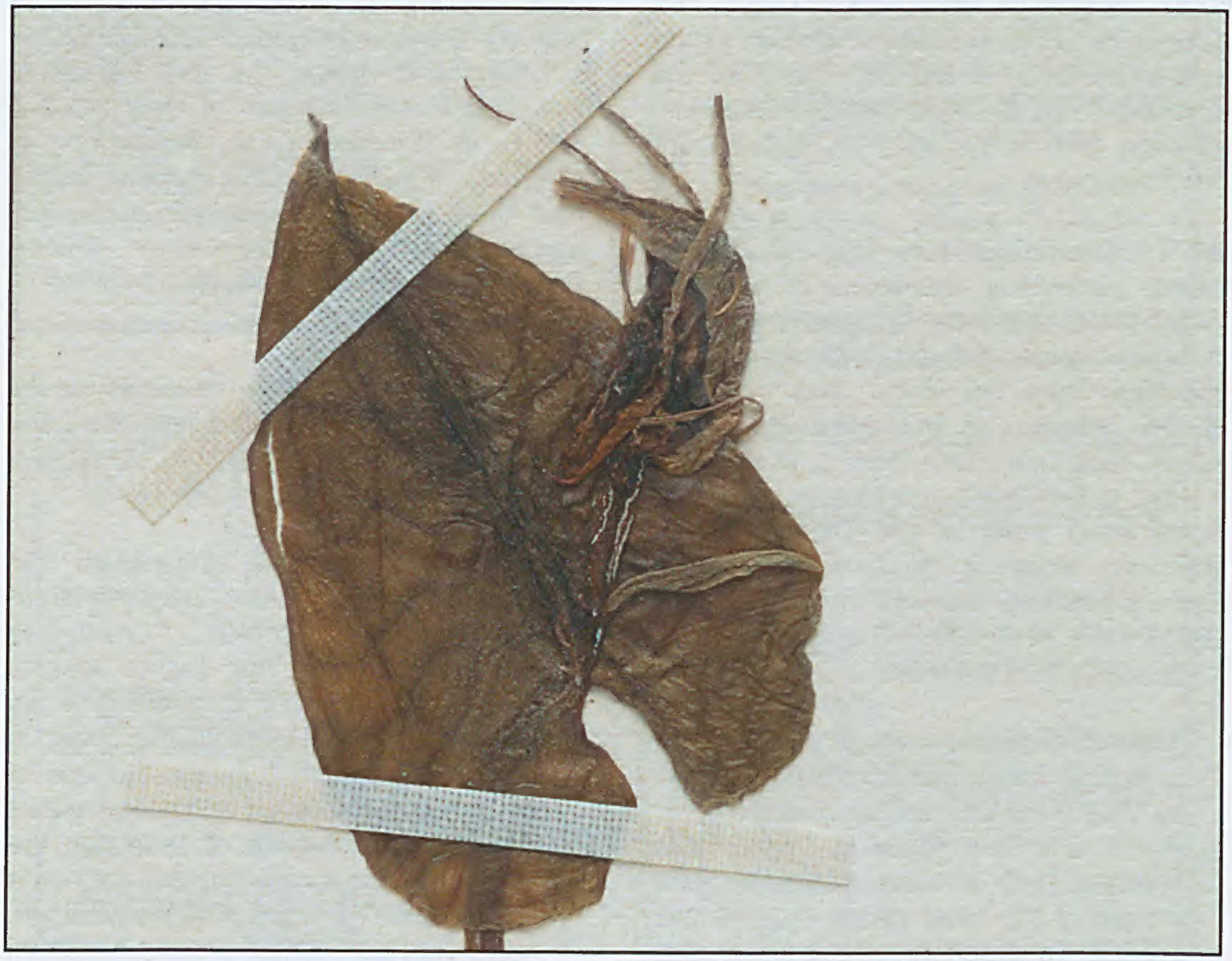
Further enquiry regarding the identity of the specimen elicited the following informative response from the Collection Manager - Botany, Barry Sneddon:

> "I have looked at the single plant that comprises this orchid specimen from Norfolk Island labeled *Corysanthes rivularis* Hook. f. The sessile leaf is certainly like that of *C. rivularis* in its shape and size. However, the flower is not complete: unfortunately, the tips of the dorsal sepal, petals and lateral sepals have all been broken off, although the dorsal sepal looks like it may have had a cauda as in *C. rivularis*. The proximal (i.e. remaining) parts of the petals and lateral sepals are similarly filiform. The labellum detail is not all that clear, apart from the

> tip which contracts suddenly into a narrow apiculus 2 mm long as in *C. rivularis*. Column details are obscured. So, there are some hints that this specimen may be *C. rivularis* (current name: *Nematoceras acuminatus* [sic] M.Clements & Hatch) but the flower is too incomplete and obscured to be certain. However, there are sufficient leaf & floral features visible on the specimen to rule out *Corybas barbarae* D.L. Jones (Lord Howe Island) as a possibility."

We can be in little doubt about a past occurrence of a species of *Nematoceras* on Norfolk Island. Mislabeling of specimens purported to be from Norfolk Island has been a problem with a few collections, but in this case the reference in the letter to Mueller and the label in Kirk's own hand, seem to leave little doubt in the matter. The most likely candidates appear to be *N. orbiculata* (A. Cunn.) Hook. f., *N. acuminata* (M.A. Clem. & Hatch) Molloy, D.L. Jones & M.A. Clem. or a hitherto undescribed endemic taxon. Interestingly, the intactness of the specimen is sufficient to rule out *Corybas barbarae* D. L. Jones, the only species to occur on Lord Howe Island. *N. orbiculata* is only found on the North Island of New Zealand and can be readily excluded on leaf shape alone (Clements & Hatch 1985). This leaves *N. acuminata* as the only likely described species.

N. acuminata, previously incorrectly known as *Corysanthes rivularis* and *Corybas rivularis*, occurs extensively down the western regions of both islands of New Zealand and on some offshore islands. As noted by Barry Sneddon above, there are strong hints that the specimen is of this species. This would not be



Herbarium specimen (WELT SP 85705) of ***Corybas rivularis*** Hook.f. from Norfolk Island. Image supplied by the Museum of New Zealand Te Papa Tongarewa(WELT SP 85705).

surprising in any way; 33 percent of the flora of Norfolk Island is shared with New Zealand (Mills 2007). There is also the tantalising possibility that this is a new endemic taxon. An endemic species, *Nematoceras dienemum* (D.L. Jones) D.L. Jones, M.A. Clem. et Molloy, does occur on remote Macquarie Island (Jones & Edgar 1993, as *Corybas dienemus*) about 1,300 kilometres to the southwest of New Zealand; this is the only known occurrence of Nematoceras outside New Zealand (Jones *et al*. 2002).

There seems little hope that the taxon still survives on Norfolk Island today, around 115 years after it was gathered by Miss Purchas. The island has been thoroughly searched by many botanists and others since that time, although new indigenous species, previously overlooked, are occasionally discovered (e.g. de Lange *et al*. 2005). Realistically, the impact of feral animals is likely to have extirpated species such as this small ground plant from the forest long ago. Rats and feral chickens have had and are having a dramatic impact on the forest plants on the island, and cattle, goats and pigs grazed the forests for a large part of the island's European history.

If we are to look for this orchid, the following habitat description provided by Clements and Hatch (1985) for *N. acuminata* may be useful:

> "in humid mixed forests between 30 m and 1100 m. Forming large colonies on the forest floor, on moss-covered logs, about the bases of tree-ferns, or scattered as solitary plants. Almost always in slightly raised, well drained positions."

Also of note is that in New Zealand *N. acuminata* is not visible above ground in summer, the plants appear in mid-winter and flower in spring (Clements & Hatch 1985).

There is perhaps some chance, albeit slim, that this taxon still exists on Norfolk Island. Could the rat control program in the national park bring about the reappearance of the species after so long? Could a small population have been overlooked all these years? Visiting botanists are encouraged to keep the species in mind when exploring the islands.

Acknowledgements

The author would like to thank the staff at the Museum of New Zealand, Wellington for their assistance in providing the information cited above. Dr Peter Weston from the National Herbarium of New South Wales made helpful comments on this paper.

References

Clements, M. A. & Hatch, E. D. (1985). *Corybas acuminatus* a new name for the species previously considered to be *Corybas rivularis*. *NZ J. Botany* 23: 491-494.

de Lange, P. J. *et al*. (2005). Vascular flora of Norfolk Island: some additions and taxonomic notes. *NZ J. Botany* 43: 563-596.

Green, P.S. (1994). Orchidaceae. *Flora of Australia* 49: 529-542.

Home, R.W. *et al*. (ed.) (2006). *Regardfully Yours. Selected Correspondence of Ferdinand von Mueller. Volume 111: 1876-1896*. Peter Lang, Bern, 909 pages.

Jones, D.L. & Edgar, E. (1993). *Corybas*. *Flora of Australia* 50: 528.

Jones, D.L. *et al*. (2002). Nomenclatural Notes Arising from Studies into the Tribe Diuridae. *The Orchadian* 13(10): 437-468.

Mills, K. (2007). *The Flora of Norfolk Island. 1. The Indigenous Flora*. The Author, Jamberoo, NSW, February.

# Dr Kevin Mills is an ecologist and botanist who is researching the flora of Norfolk Island; he has extensive experience with the flora of eastern New South Wales.

Note. In this paper, I have used the name *Nematoceras*, although I appreciate that this genus is not accepted by all botanists; similarly, the species names may not be universally accepted.

-oOo-

Two new species of *Oligochaetochilus* (Orchidaceae) from South Australia.

a234477

David L. Jones
Centre for Plant Biodiversity Research
GPO Box 1600, Canberra, A.C.T., 2601, Australia.

Abstract

Two threatened taxa from South Australia, *Oligochaetochilus mirabilis* and *O. psammophilus*, are described as new.

Key Words

Orchidaceae, *Oligochaetochilus mirabilis, O. psammophilus,* new species, endangered, Australian flora, South Australia.

Introduction

Oligochaetochilus is a complex genus of about 60 named species with numerous others awaiting formal identification. The genus is well developed in southern Australia with elements extending into the tropics on the eastern side of the continent (Jones & Clements 2002). Two species from South Australia, one a rare species with a restricted distribution, the other with a greatly reduced distribution, are described here as new.

Materials and Methods

The description of the new taxa was made from fresh and dried specimens. Dried specimens of *Oligochaetochilus* species were examined from the following herbaria: AD, BRI, CANB, HO, MEL, NSW and PERTH. Unless otherwise indicated, all types of related *Oligochaetochilus* taxa (or photographs thereof) have been examined.

Taxonomy

1. *Oligochaetochilus mirabilis* D.L.Jones., ***sp. nov.***; affinis *O. despectanti* (Nicholls) D.L.Jones & M.A.Clem., sed plantis altioribus; floribus praecipue viridis; petalis rectis lobo basali majore; labello elliptico, marginibus crenatis et lobo basali lato plano, differt.

Type: South Australia. Eyre Peninsula: Cowell to Kimba Road, 23 Nov. 1983, *R.Bates 3645* (holo AD 98421325).

Description: *Tubers* not seen. *Leaves* sessile, 5-8 in a radical rosette, loosely imbricate, usually withered at anthesis; lamina narrowly elliptical to obovate, 8-20mm long, 4-8 mm wide, dull green, obscurely veined; margins fringed with tiny white acicular cells; apex acute. *Scape* 5-14 cm tall, 2-3 mm diam., 1-7(-10)-flowered. *Sterile bracts* 3-4, closely sheathing, oblong-ovate, 10-20 mm long, 4-6 mm wide, acuminate, usually chartaceous at anthesis. *Floral bracts* closely sheathing, imbricate, ovate-lanceolate, 8-20 mm long, 3-6 mm wide, acuminate. *Pedicels* 6-18 mm long, slender, straight or slightly curved. *Ovary* oblong to narrowly obovoid, 6-8 mm long, c. 1 mm wide, green. *Flowers* opening suberect, becoming porrect to nodding; galea transparent with green bands; lateral sepals with darker green bands; petals transparent with 1-2 light green lines. *Galea* curved at the base, nearly flat medially, suddenly decurved to the apex, glabrous; petal flanges relatively large, nearly touching and closing off the base of the galea, green; petal margins flared. *Dorsal sepal* 18-26 mm long including the apical point, cucullate, decurved in the distal quarter; apical point porrect to decurved, filiform, 8-16 mm long. *Lateral sepals* deflexed; conjoined part slightly wider than the galea, shallowly concave, ovate-elliptical when flattened, 8-10 mm long, 7-9 mm wide; margins flat, glabrous or with a few short clear trichomes; sinus narrow, the margins glabrous; free points filiform, 18-25 mm long, parallel or divergent, curved shallowly forwards, 3-5 mm apart at the tips. *Petals* asymmetrical, elliptic-lanceolate, 10-13 mm long, 3.5-4 mm wide, straight; dorsal margin thickened, green, hirsute; anterior margin glabrous; proximal flange relatively large, green. *Labellum* highly irritable, attached by a green, ligulate basal claw c. 2.5 mm long, c. 1.5 mm wide. *Lamina* elliptical, 4.5-5 mm long, c. 2.5 mm wide, green; basal lobe lower than the main lamina, flat, c. 1.5 mm long, c. 1.8 mm wide, covered with beaded siliceous cells; adaxial surface covered with beaded siliceous cells, proximally with a short tapered channel, nearly flat distally; abaxial surface with a deep, narrow central channel extending from the basal lobe nearly to the apex, flanked by 2 thick whitish ridges; margins crenate, with numerous short acicular siliceous cells; apex obtusely apiculate. *Labellum marginal setae* spreading, 16-22, the longest to c. 0.8 mm long, each basal swelling with an erect seta c. 2 mm long. *Column* porrect from the end of the ovary, recurved, 9-11 mm long, c. 2.5 mm wide. *Column wings* more or less rectangular, c. 2.3 mm long, c. 1 mm wide; upper lobe vestigial; basal lobe ovate, ciliate; barrier trichomes irregularly moniliform, exserted. *Anther* c. 1.2 mm long, obtuse. *Pollinia* linear-oblong, c. 1.7 mm long, yellow, mealy. *Stigma* oblong-elliptic to narrowly scutiform, c. 6 mm long, c. 1.2 mm wide. *Capsules* not seen. **Fig. 1.**

Distribution and ecology: Apparently restricted to the Eyre Peninsular in South Australia where known from about three localities. It grows among rocks on hilly slopes covered by shrubby vegetation. Alt. 75-200 m. Flowering: December to February.

Recognition: Characterised by late-flowering habit, thickish scape 5-14 cm tall, relatively small flowers that are transparent and green, carried on long slender pedicels, the flowers suberect when first open then becoming porrect to strongly nodding, long filiform points on the sepals, petals that are nearly straight, and a flat, elliptical labellum with a broad basal lobe, numerous short marginal cilia and two erect basal setae.

Similar species: This new species bears many similarities to *O. despectans* which is much shorter growing but with very similar flowers. The flowers of *O. despectans* often have brown tones (sometimes dark brown), the petals are falcate with a very small basal lobe that does not block access to the base of the flower and the labellum is broadly elliptic to obovate with a narrow backward-sloping basal lobe. Because of its very short scape, the sepal tips of *O. despectans* often come in contact with the ground but this does not occur in *O. mirabilis* because of its taller scapes. In South Australia the two species are separated by a significant geographical gap, with *O. despectans* occurring in the Northern Lofty Ranges and *O. mirabilis* being confined to the Eyre Peninsula.

Notes: This species has been known as *Oligochaetochilus* aff. *despectans* "Eyre Peninsula" (Bates *et al*. 2006). Details of the fruiting habit of this species have not been recorded but it is probable that the pedicels and capsules become stiffly erect prior to dehiscence as they do in *O. despectans*. A cultivated plant continued flowering until 2 Feb. 1990 by which time it had produced 8 flowers and still had two buds to open (R.Bates pers. comm.).

Conservation status: Known from about three localities and apparently of highly restricted distribution; not known to be conserved but recorded as locally common at one site; suggest 2E by the criteria of Briggs & Leigh (1996).

Etymology: The Latin *mirabilis*, wonderful, astonishing, in reference to the extraordinary appearance of the species and the attitude of its flowers.

Other specimen: SOUTH AUSTRALIA. Carpie Puntha Hill, 20 Dec. 1985, *P.Bell (R.Bates 6741)* (AD); Darke Peak, 29 Dec. 1989, *R.Bates* (CANB); Coolanie Valley, between Cowell and Kimba, 2 Jan. 1985, *R.Bates 5023* (AD).

2. *Oligochaetochilus psammophilus* D.L.Jones., ***sp. nov.***; affinis *O. biseto* (Blackmore & Clemesha) Szlach., sed superiore florescentia; caulis brevioribus et pinguibus; floribus praecipue viridis (interdum brunneis pallidis);sepalis lateralibus latioribus, punctis liberis relative brevibus divergentibus; labello rallo, oblongo-elliptico ad ellipticum, lobo basali circa tam lato quam lamina, differt

Type: South Australia. Cockatoo Valley, 9 Sept. 1995, *R.Bates 41985* (holo CANB 640329).

Description: *Tubers* not seen. *Leaves* sessile, 6-12 in a radical rosette, loosely imbricate, green or withered at anthesis; lamina narrowly ovate-oblong to elliptical, 10-50 mm long, 5-12 mm wide, dull green, obscurely veined; margins fringed with numerous tiny white acicular cells; apex acute to acuminate. *Scape* 8-18 cm tall, c. 2 mm diam., 1-12-flowered. *Sterile bracts* 3-4, closely sheathing, oblong-ovate, 10-20 mm long, 4-6 mm wide, acuminate, usually chartaceous at anthesis. *Floral bracts* closely sheathing, ovate-lanceolate, 5-14 mm long, 3-5 mm wide, acuminate. *Pedicels* 3-7 mm long, slender, straight or slightly curved. *Ovary* oblong to narrowly obovoid, 4-6 mm long, c. 1.5 mm wide, green. *Flowers* porrect to nodding; galea translucent white with green or light brown bands; lateral sepals similar or darker, with chequered patterns; petals transparent with 1-2 green or light brown lines. *Galea* shallowly curved at the base, nearly flat medially, suddenly decurved to the apex, glabrous; petal flanges small, not touching and not closing off the base of the galea, brown; petal margins slightly flared. *Dorsal sepal* 17-26 mm long including the apical point, cucullate, decurved in the distal quarter; apical point porrect to upcurved, filiform, 5-9 mm long. *Lateral sepals* deflexed; conjoined part much wider than the galea, shallowly concave to nearly flat, broadly ovate when flattened, 10-12 mm long, 9-11 mm wide; margins flat or slightly incurved, hirsute, with prominent clear trichomes to c. 1 mm long; sinus narrow, the margins glabrous; free points filiform, 8-17 mm long, divergent, 10-16 mm apart at the tips. *Petals* asymmetrical, elliptic-lanceolate, 11-13 mm long, 4-4.5 mm wide, falcate; dorsal margin thickened, green or brown, hirsute; anterior margin glabrous; proximal flange vestigial. *Labellum* highly irritable, attached by a green, ligulate basal claw c. 3 mm long, c. 2 mm wide. *Lamina* oblong-elliptic to elliptic, 6-8 mm long, 2.5-3 mm wide, green to light brown; basal lobe lower than the main lamina, prostrate, c. 2 mm long, c. 2.5 mm wide, covered with beaded siliceous cells; adaxial surface nearly flat, covered with beaded siliceous cells, proximally with a broad channel, narrowed distally; abaxial surface with a deep, narrow central channel extending from the basal lobe nearly to the apex, flanked by 2 thick whitish ridges; margins entire, covered with short siliceous cells; apex obtuse. *Labellum marginal setae* spreading or curved forwards, some apical ones erect, 20-30, the longest to c. 2 mm long, each basal swelling with a long erect seta c. 3 mm long. *Column* porrect from the end of the ovary, recurved, 14-16 mm long, c. 3 mm wide. *Column wings* more or less rectangular, c. 4 mm long, c. 2.5 mm wide; upper lobe vestigial; basal lobe shortly ovate, ciliate; barrier trichomes irregularly moniliform, exserted. *Anther* c. 1.5 mm long, obtuse. *Pollinia* linear-oblong to linear-obovate, c. 2.5 mm long, yellow, mealy. *Stigma* oblong-elliptic, c. 8 mm long, c. 2 mm wide, the upper margins irregular. *Capsules* not seen. **Fig. 2.**

Distribution and ecology: Occurs in the Barossa Valley and northern parts of the Yorke Peninsula, South Australia. Also noted as occurring on the Eyre Peninsula (Bates *et al.* 2006) but specimens are lacking. Grows in broombush thickets and *Callitris* woodland in well-drained sand. Alt. 250-350 m. Flowering: late August to October.

Recognition: Characterised by early flowering period, short sturdy stems, flowers mostly translucent white and green (sometimes translucent white and light brown), broad lateral sepals with relatively short, divergent free points and a thin-textured, oblong-elliptic to elliptic labellum with the basal lobe about as wide as the lamina, two prominent long basal setae and numerous short spreading marginal setae.

Similar species: The new species has affinities with *O. bisetus* but is readily distinguished by its earlier flowering period, short sturdy stems, flowers mostly green (sometimes light brown), broad lateral sepals with relatively short free points and a thin-textured, oblong-elliptic to elliptic labellum. By contrast *O. bisetus*, which flowers 2-4 weeks later than *O. psammophilus*, is taller growing with much larger flowers that are mostly brown, narrower synsepalum with much longer filiform points, broader petals and a thin-textured obovate labellum with a broadly obtuse apex.

Notes: This species has been known as *Pterostylis* "Sandy Creek" and *Oligochaetochilus* "Sandy Creek" (Bates *et al.* 2006). The new species grows sympatrically with *O. bisetus* at some sites, generally flowering 3-4 weeks earlier than *O. bisetus*, and natural hybrids are unknown. Bates in Bates *et al* (2006) suggests this new species also occurs in New South Wales but there are no specimens to support this assertion.

Conservation status: Relatively widespread but severely impacted by agricultural activities; conserved in the Sandy Creek Conservation [?National] Park; suggest 3RC according to Briggs & Leigh (1996).

Etymology: The Greek *psammo*, sand, -*philus*, loving, in reference to the apparent predilection this species has for sandy soils.

Other specimens: SOUTH AUSTRALIA: Sandy Creek Conservation Park, 28 Oct. 1986, *R.Bates 7877* (AD); *ibid*, 23 Aug. 1995, *K.A.Bayley (D.L.Jones 14260)* (CANB); Sandy Creek Conservation Park, Sir Keith Wilson Zone, 8 Sept. 1999, *D.L.Jones 16768, M.Garratt & R.J.Bates* (CANB); Sandy Creek Natl. Park, 8 Oct. 1968, *J.Warcup* (AD).

Acknowledgements

I thank Emma Clifton for technical assistance, Bob Bates, Ken Bayley and Denzel Murfet for information and specimens and Emma Clifton for commenting on the manuscript. Laurie Adams provided the Latin diagnoses and the Directors of the following herbaria are acknowledged for allowing access to specimens; AD, CANB. MEL, NSW, PERTH.

Literature Cited

Bates, R., *et al.* (2006). *South Australian Native Orchids – Electronic Version.* Native Orchid Society of South Australia.

Briggs, J.D & Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition, CSIRO and Australian Nature Conservation Agency.

Jones, D.L. & Clements, M.A. (2002). A new classification of *Pterostylis* R.Br. (Orchidaceae). *Austral. Orch. Res.* 4: 64-124.

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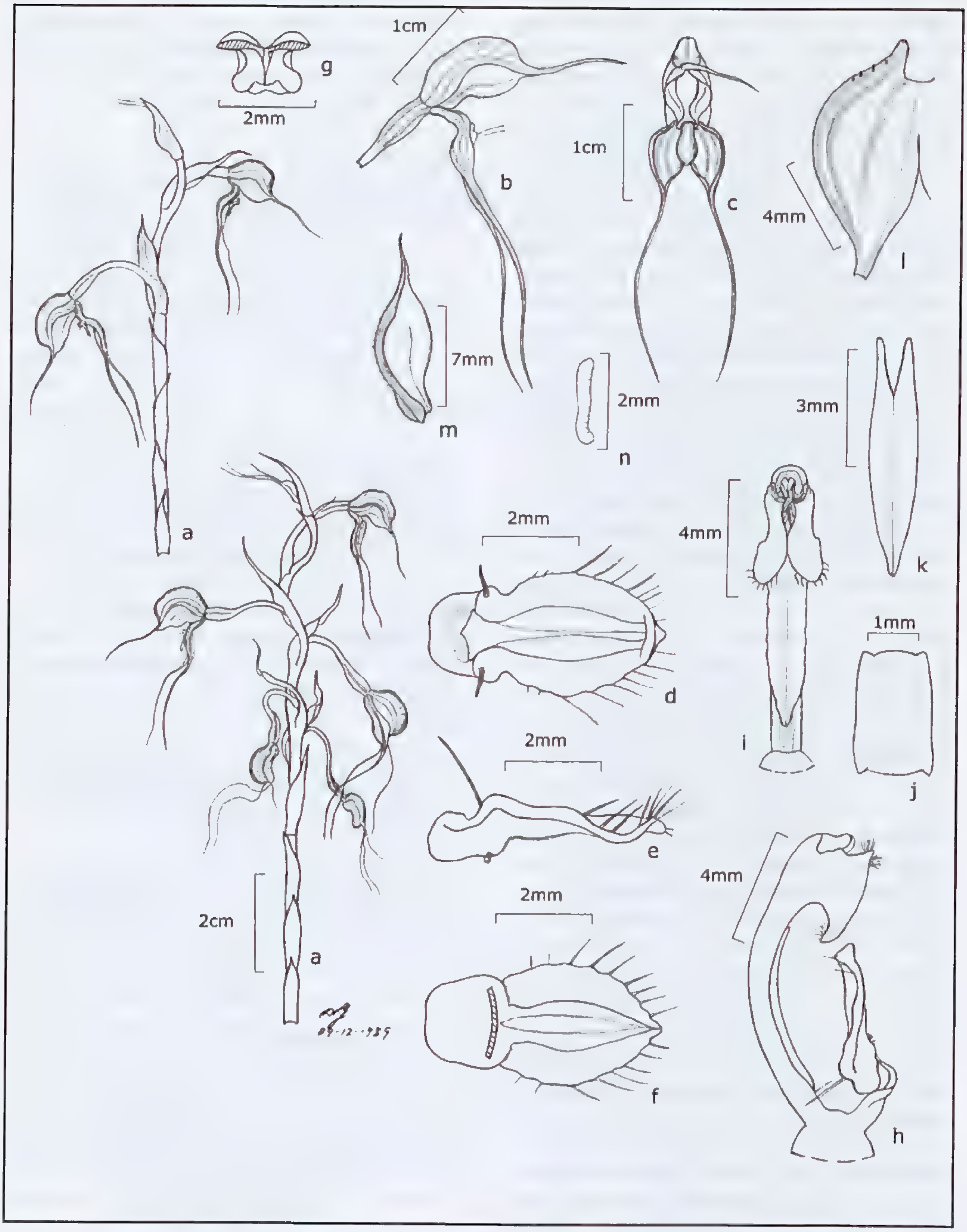

Fig. 1. ***Oligochaetochilus mirabilis***, Darke Peak, SA, *R Bates*. a. flowering plants; b. flower from side; c. flower from front; d. labellum from above, flattened out; e. labellum from side; f. labellum from below; g. cross-section of labellum; h. column and labellum from side; i. column from front; j. labellum strap; k. stigma; l. part of synsepalum, dorsal view; m. petal; n. pollinium. Drawn 29/12/1989 by D.L.Jones©.

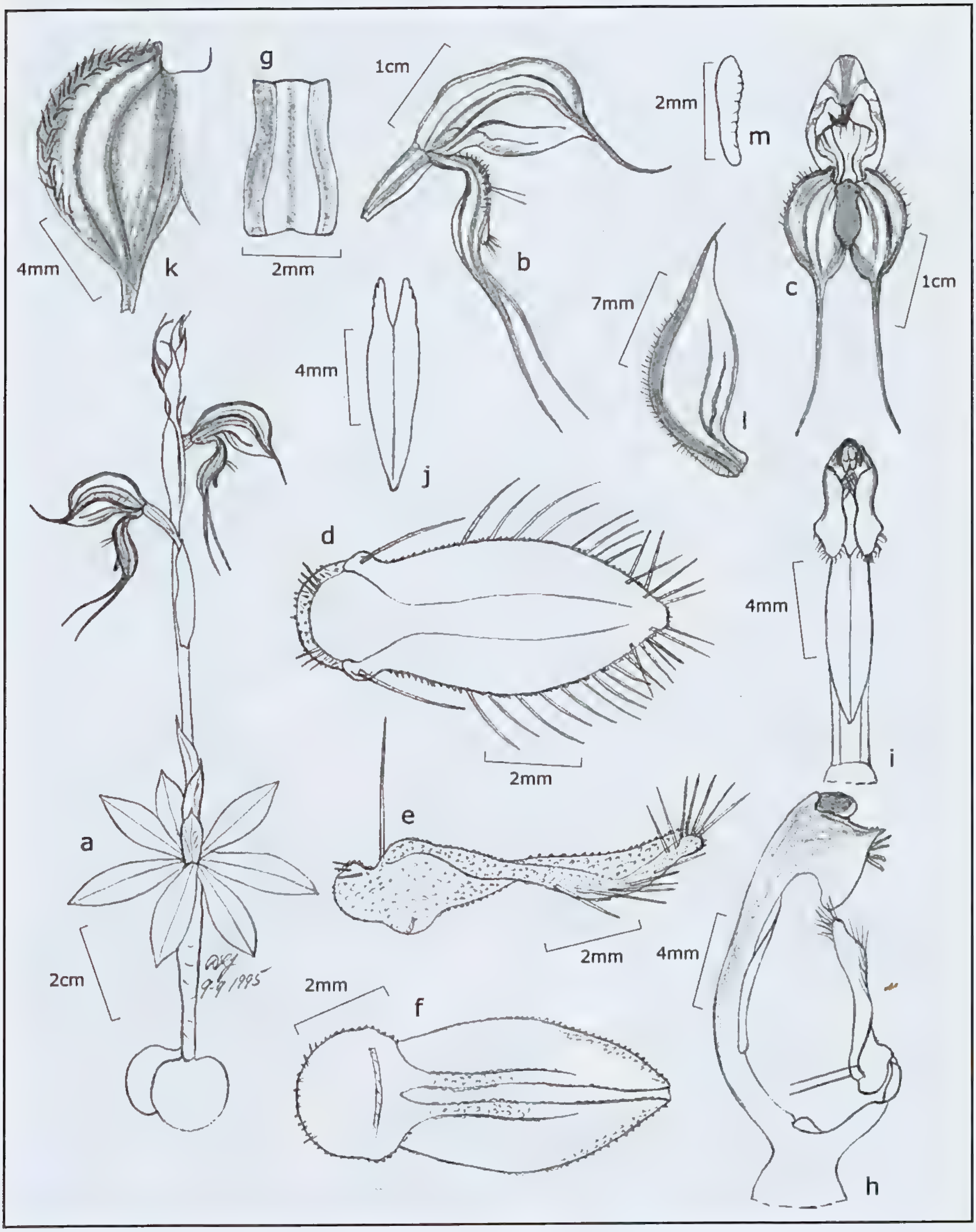

Fig. 2. ***Oligochaetochilus psammophilus***, Cockatoo Valley, SA, *R Bates 41985* – drawn from the type collection. a. flowering plant; b. flower from side; c. flower from front; d. labellum from above, flattened out; e. labellum from side; f. labellum from below; g. labellum strap; h. column and labellum from side; i. column from front; j. stigma; k. part of synsepalum, dorsal view; l. petal; m. pollinium. Drawn 9/9/1995 by D.L.Jones©.

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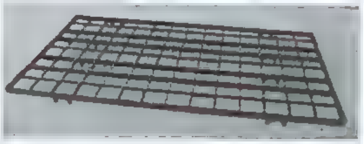

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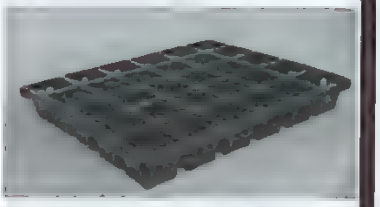

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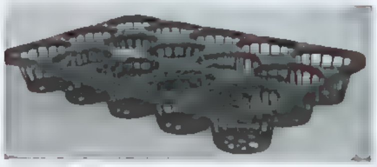

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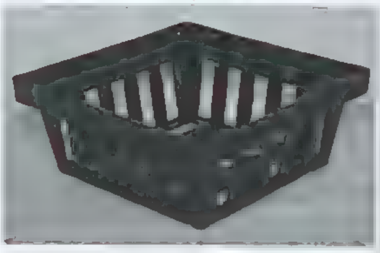

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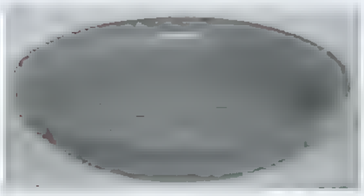

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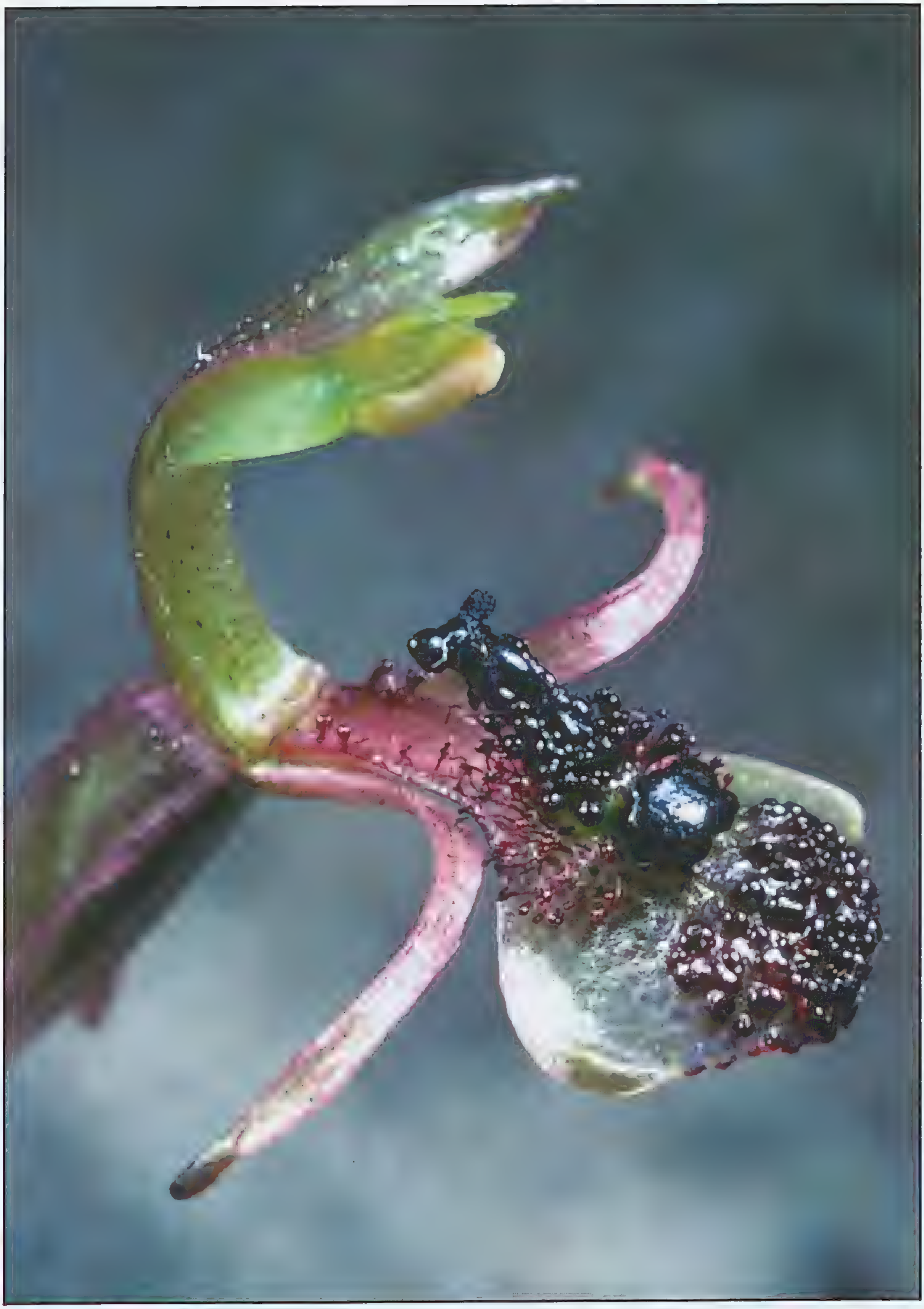

Plate 1. Ant-like labellum glands of *Myrmechila formicifera*, which in fact mimic a female thynnine wasp.

The Wasp, Ant and Bird Orchids of the *Chiloglottis* Alliance – A General Overview

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Abstract

Taxonomic research on the genus *Chiloglottis sensu lato* over the last twenty years has resulted in the description of some eighteen new species and the splitting of the genus into three segregate genera. As well as the taxonomic work, there is a major ongoing research effort aimed at understanding the pollination and evolution of the genus, which has implications for the taxonomy. The published information on the *Chiloglottis* alliance is scattered in many reports and scientific papers. This is the first in a series of articles that collate information on distribution, habitats, pollination biology and morphological differences among the species of the *Chiloglottis* alliance. This introductory article provides a general overview of the group.

Introduction

Wasp, Ant and Bird Orchids of the *Chiloglottis* alliance, are common, but rarely noticed denizens of moist forests, sheltered slopes, damp shady gullies, grassy montane habitats and sphagnum hummocks in the forests and woodlands of eastern Australia. Cryptic and inconspicuous, the small maroon, pale green or brownish flowers blend into the background, escaping the attention of the casual observer. The most obvious signs of these orchids are the twin opposite ground-hugging leaves, usually in massed colonies. In most years flowering is sparse and one must search the colonies for the occasional thin stem arising between the paired leaves. Often, it is only after finding a stem that the single small flower materialises at its apex.

The Wasp and Ant Orchids are named for the remarkable resemblance of their labellum calli to hymenopterous insects. Indeed, R.D. Fitzgerald (1877) named *Chiloglottis formicifera* (now *Myrmechila formicifera*) 'from the likeness of the glands on the labellum to an ant' (family Formicidae) (Plate 1). *Chiloglottis reflexa* (Labill.) Druce has a similarly insectiform labellum, which is missing from the type specimen. It is thought the original collector, Labillardiere, removed the labellum thinking it was an insect stuck to the specimen(!) (M.A. Clements, personal communication).

Dockrill (1956) was the first to discover the function of the insect-like labellum glands when he observed black wasps attempting to copulate (pseudocopulation) with the labellum of *C. formicifera* (now *Myrmechila platyptera*) at Barrington Tops in November 1954. He interpreted the ant-like labellum glands as mimicking a female wasp, which he mistook for an ichneumonid. Giles (1964) correctly reported that wasps he observed pseudocopulating on *Chiloglottis reflexa* at Batlow (probably plants currently known as *C. trilabra*) belonged to the family Thynnidae (Plate 2). Since that time all studies of pollination in the *Chiloglottis* alliance have reported male Thynnine wasps (now Tiphiidae subfamily Thynninae) as the pollinators.

Plant Habit and Flower Structure

The unifying characteristic of *Chiloglottis* alliance species is the pair of equal prostrate oblong or ovate leaves that usually lie opposite each other on the substrate (Plate 3), but may be erect if the plant is pushing up through dense growth. All species have a single flower, either almost sessile between the leaves, or borne on an erect stem to about 15 cm high, which elongates after fertilisation to aid wind borne seed dispersal.

There are two main plant types in the *Chiloglottis* alliance. The so-called 'gunnii' group (now *Simpliglottis*) has broad ovate to circular, somewhat leathery leaves with straight margins and relatively large sessile or short-stalked flowers. By contrast, the 'reflexa' group (now *Myrmechila* and *Chiloglottis*) has narrower oblong leaves of thin texture, often with undulating or wrinkled margins. Flowers of the 'reflexa' group are small and borne on stalks much longer than the flower.

Flower morphology of the two groups is quite divergent. The labellum of 'gunnii' type flowers is concave, heart-shaped, rotates passively on a flexible hinge to form a tight fit against the column and has loosely clustered non insect-like calli. The lateral sepals are thin and project forward below the labellum, which may rest on them, while the petals are broader, spreading horizontally or curved upwards to partially cover the gap between the resting labellum and the column (Plate 4). 'Reflexa' type flowers are much more open, the petals being reflexed against the ovary, and the flat trapezoid or rhomboid labellum held horizontally, or erect in some species, to display the dense cluster of wasp-mimicking calli (Plate 1). The two flower types suggest two distinct pollination mechanisms have evolved in the *Chiloglottis* alliance.

The large crowded colonies often associated with the *Chiloglottis* alliance are mainly the result of vegetative reproduction (Plate 5). Plants have a small globular or ovoid tuber from one to seven or more centimeters below the surface depending on the substrate. Each season after a period of dormancy, a vertical stem from the tuber ascends to the surface forming few to many lateral roots. The stem shoots at the surface giving rise to the twin leaves. During the growing period, a replacement tuber is produced next to the parent tuber. Two daughter tubers are also formed at the ends of lateral roots arising from the stem just below the soil surface. The daughter tubers may be as far as 20 cm from the parent plant and are responsible for colony extension (Plate 6). Daughter plants are clones of the parent and genetic analysis has shown that large colonies may contain only one or a few genetically distinct clones comprising hundreds or thousands of leaves extending over several meters (R. Peakall, personal communication).

The long lateral roots with daughter tubers perform an important function in the *Chiloglottis* alliance. Overexploitation of soil resources is likely in the very crowded colonies often formed by these species, which may explain why flowering is so sparse. The lateral roots provide a means for some plants to migrate to fresh unexploited sites. This is equivalent to repotting the tubers into new soil as a means of maintaining flowering, which is necessary every one to two years for *Chiloglottis* alliance species in cultivation (Jones 2006a).

Brief Taxonomic History of the *Chiloglottis* Alliance

Robert Brown described the genus *Chiloglottis* in 1810, with *C. diphylla* as type species. However, Labillardiere in 1806 had previously incorrectly described a collection of *Chiloglottis reflexa* from Tasmania in the European genus *Epipactus*. This mistake was not corrected until 1917 by Druce. The next species described were *C. gunnii* in 1840 and *C. cornuta* in 1844 by John Lindley and J.D. Hooker, respectively. The first resident Australian orchidologist, Robert Fitzgerald, described three species, *C. formicifera*, *C. trapeziformis* and *C. trilabra* in his monumental folio work, 'Australian Orchids' in 1877. In 1918, R.S. Rogers added *C. pescottiana*, which is now recognised as a natural hybrid between *C. valida* and *C. trapeziformis*. *C. dockrillii*, described by the Reverend Herman Rupp in 1953, is now a synonym of *C. trilabra*.

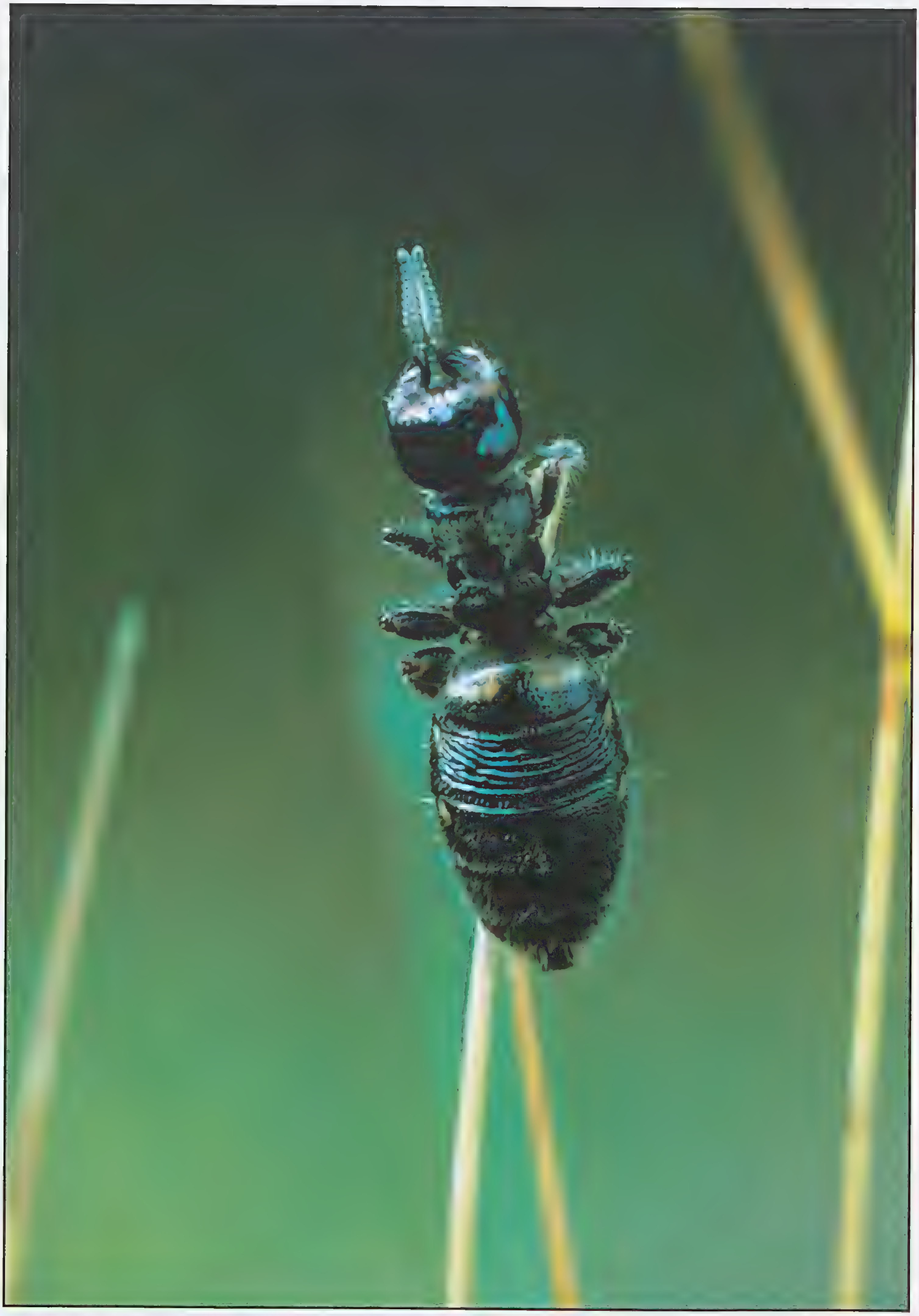


Plate 2. Typical female thynnine wasp as mimicked by orchids of the *Chiloglottis* alliance.

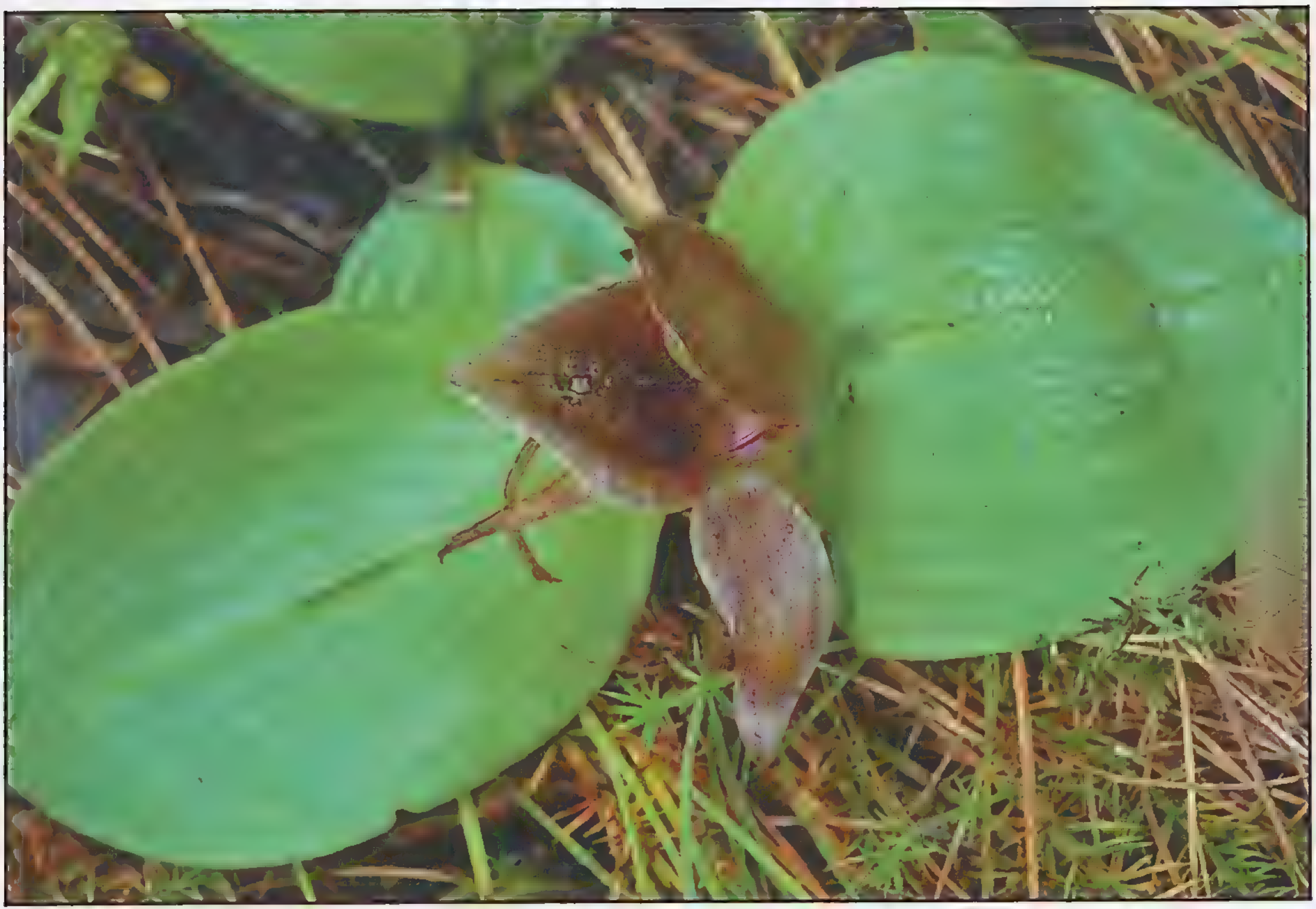


Plate 3. Paired opposite leaves characteristic of the *Chiloglottis* alliance (*Simpliglottis turfosa*).

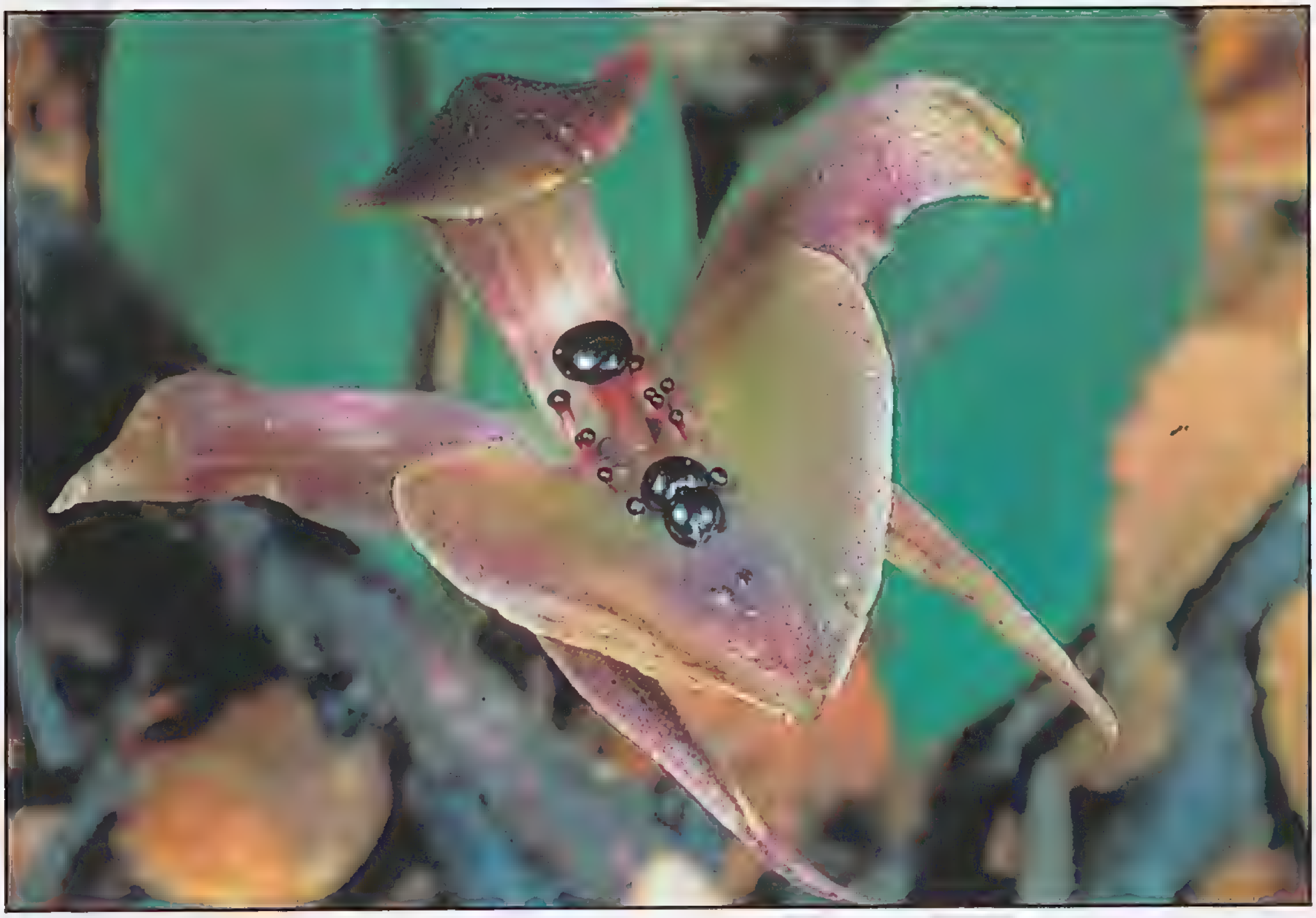


Plate 4. Flower of *Simpliglottis gunnii*.

The preceding account is summarised from Clements (1989).

The modern era in *Chiloglottis* taxonomy began with the description of *Chiloglottis truncata* and *C. sylvestris* by David Jones and Mark Clements in 1987, which brought the number of species in the *Chiloglottis* alliance to nine and one hybrid. 1991 was a watershed year in which thirteen species were described including two from Tasmania, *C. grammata* and *C. platychila*, by Geoff Carr (1991) and eleven in one publication by David Jones (1991) as follows; *C. anaticeps*, *C. chlorantha*, *C. longiclavata*, *C. palachila*, *C. platyptera*, *C. pluricallata*, *C. seminuda*, *C. sphyrnoides*, *C. trullata*, *C. turfosa* and *C.valida*. *C. platychila* Carr was subsequently synonymised with *C. gunnii* Lindl. by Jones (1998). Over the last ten years a further three species have been added, *C. jeanesii* (Jones 1997), *C. triceratops* (Jones 1998) and *C. sphaerula* (Jones 2006b), bringing the total number of described species to twenty four and one hybrid (Jones 2006a, b).

The first step in splitting *Chiloglottis* into three segregate genera was the erection of the genus *Simpliglottis* (Szlachetko 2001) to accommodate the distinctive large flowered *Chiloglottis gunnii* group. For a short time *Simpliglottis* was reduced to subgeneric status within 'The *Chiloglottis* Alliance' (Jones 2002), but was maintained as a genus by Jeanes (2002) who also named the hybrid genus x*Chilosimpliglottis* to accommodate *C. pescottiana*, whose parents are now in different genera. Detailed molecular genetic studies on fifteen species (Mant *et al.* 2002) showed there are at least three genetically distinct and coherent groups within the *Chiloglottis* alliance. These are the *C. gunnii* group (*Simpliglottis*), the late summer / autumn flowering *C. reflexa* group and the spring flowering *C. formicifera* group. The *C. reflexa* and *C. formicifera* groups are also consistently different in their lateral sepals; the former being much shorter with shorter apical clubs than the latter. Jones and Clements (2005) erected the genus *Myrmechila* for the 'formicifera' group.

Pollination Mechanism

Apart from *Simpliglottis cornuta*, which is self-pollinating, most *Chiloglottis* alliance species so far tested are pollinated by sexual deception of male thynnine wasps of the genus *Neozeleboria* or closely related genera (Bower 1992, 1996; Bower and Brown 1997; Peakall *et al.* 1997, 2002; Mant *et al.* 2005a, b). The exception is *Simpliglottis grammata* in Tasmania which is pollinated by a species of the distantly related thynnine genus *Eirone* (Mant *et al.* 2005a). The orchids mimic not only the shape and colour of a female thynnine, but also the wind-borne sex pheromone odour she uses to attract males from a distance. The imitation pheromone, or allomone, is emitted from glands (osmophores) on the labellum calli and sepal clubs of the orchid. Downwind males detect the odour and follow the scent trail upwind to the flower. A recent breakthrough has been the chemical identification of the allomone of *Myrmechila trapezifomis* (*Chiloglottis trapeziformis*) and confirmation that it is identical to the sex pheromone of its pollinator, *Neozeleboria cryptoides* (Schiestl *et al.* 2003). The chemical, a cyclic diketone, has the common name, chiloglottone.

Males attracted to *Myrmechila* and *Chiloglottis* flowers may zig zag in front of the flower or circle around it before landing near it, or on the stem, or directly on the labellum or sepal clubs. Wasps landing near the flower may walk to the stem and climb up, or fly again and land on or near the labellum. Peakall and Handel (1993) suggest that males are attracted from the distance by the allomone, and use visual cues to find the female at close range. Occasionally, males may attempt to mate with the sepal clubs, rather than the insectiform labellum, indicating that even at close range chemical cues can be more important that visual ones.

Males crawl over the labellum calli seeking the head and thorax region of the 'female', while probing the calli or labellum margin with the genital claspers at the tip of the abdomen in an attempt to couple (Plate 7). Males that orient 'correctly' on the decoy, will grasp it with the forelegs just behind the head region, as they would a female (Plate 7), and attempt to lift it and fly away. This action brings the male's thorax into contact with the overhanging column (Plate 8) allowing any attached pollinia to pollinate the sticky stigma. After failing to move the female, males may move backwards receiving a coating of glue on the thorax from the rostellum before pushing open the anther flaps and removing one or both pollinia. However, pollinia removal or pollination can also occur by males simply moving over the 'head' region of the 'female' and squeezing below the column.

Pollination in *Simpliglottis* differs in several ways from *Myrmechila* and *Chiloglottis*. The initial approach by wasps to flowers is the same in all three genera. However, the sepal clubs of *Simpliglottis* are very small and unattractive to incoming males, which walk or fly straight onto the labellum. While probing with the abdomen, males move over the calli towards the tall knobbed central callus at the base (Plate 9). Known as the major proximal callus (Jones 1991), it is inclined towards the labellum apex. Males generally move between the callus and the column while attempting to mount and grapple it with their forelegs below the apical knob; in the process tipping the finely balanced labellum against the column. Trapped between the concave labellum and the column, the male must move upwards over the labellum calli to escape. The male's weight holds the labellum closed forcing it's thorax to contact the stigma, rostellum and anthers in that order, first pollinating the flower, if it is carrying pollinia, then picking up additional pollinia on its departure (Plate 10).

Pollinator Specificity

A key feature of pollination by sexual deception of male insects is that each orchid species has a single unique pollinator (Table 1). This characteristic of sexual deception has been exhaustively tested by the author for most species in the *Chiloglottis* alliance by using pollinator choice tests in the field (Bower 1996, 2006, Bower and Brown 1997). Experiments have been carried out through much of eastern Australia from the Blackdown Tableland in Queensland to Portland in western Victoria and Tasmania. Pollinator choice tests are a rigorous method for determining the degree of pollinator specificity in sexually deceptive orchids (Plates 11 and 12). Several sets of flowers from different *Chiloglottis* alliance species, populations or geographical areas can be compared for their attraction to populations of particular wasp species. For example, a population of the known pollinator of *Myrmechila trapeziformis* can be exposed in a choice test to several other orchid species to see if any of them are attractive to it, and hence may have the same or a functionally similar allomone. When *Chiloglottis* alliance species that occur in the same geographical region in the wild, and flower at the same time, are tested together in their normal range and habitats, different wasps are always attracted to each species.

However, a complication is that some orchid and wasp species appear to have similar allomones to other species, but only if they are separated by geography or altitude. For example, *Myrmechila trapeziformis* and *Simpliglottis valida* have the same allomone (Schiestl and Peakall 2005), but different pollinators, and are usually separated by altitude. Where there is occasional overlap in distribution, the hybrid *Chiloglottis* x *pescottiana* (**x***Chilosimpliglottis pescottiana*) may be produced (Peakall *et al.* 2002). The apparent sharing of similar attractant chemicals by different *Chiloglottis* alliance orchid and pollinator species across

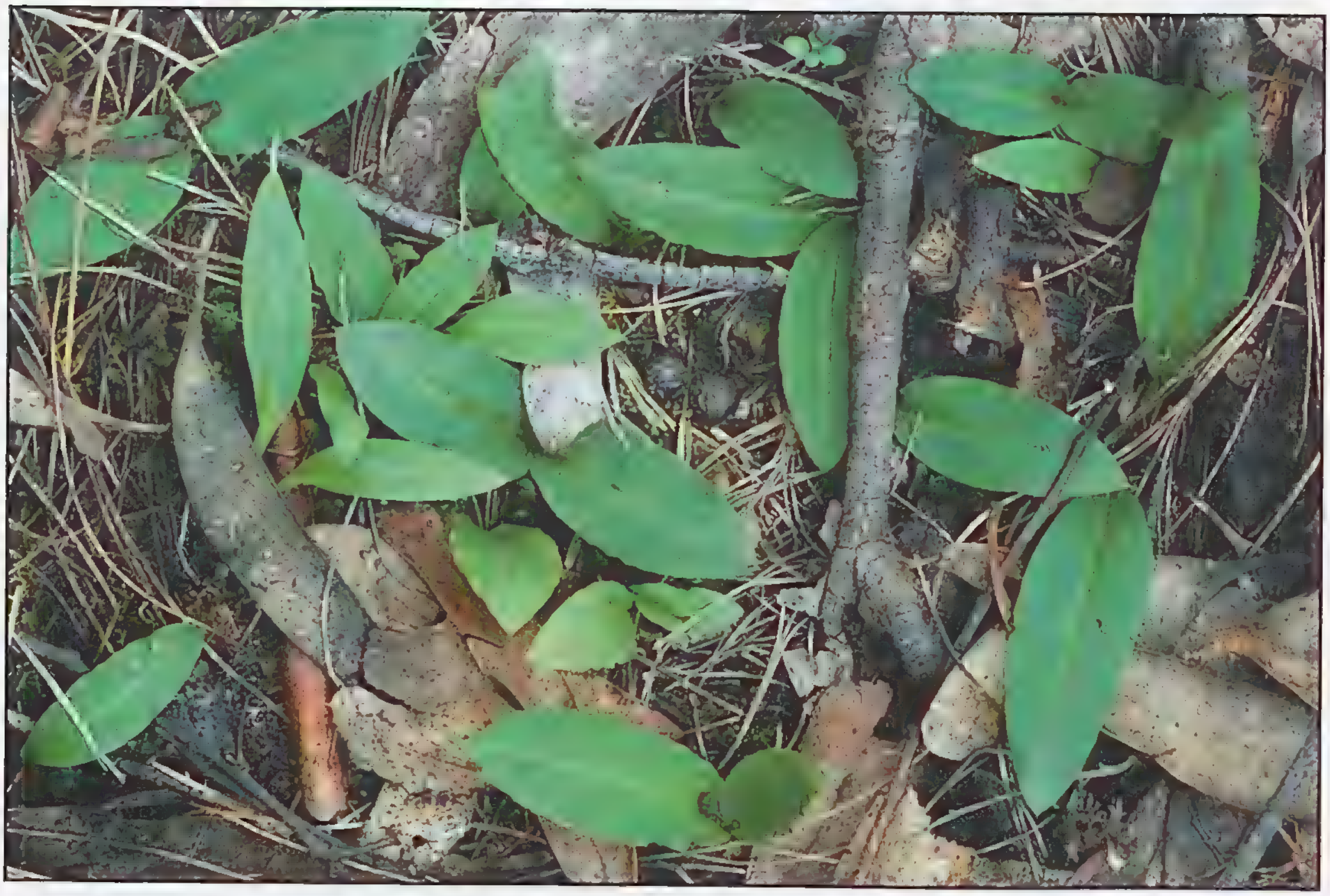


Plate 5. Colony of *Myrmechila trapeziformis* plants.

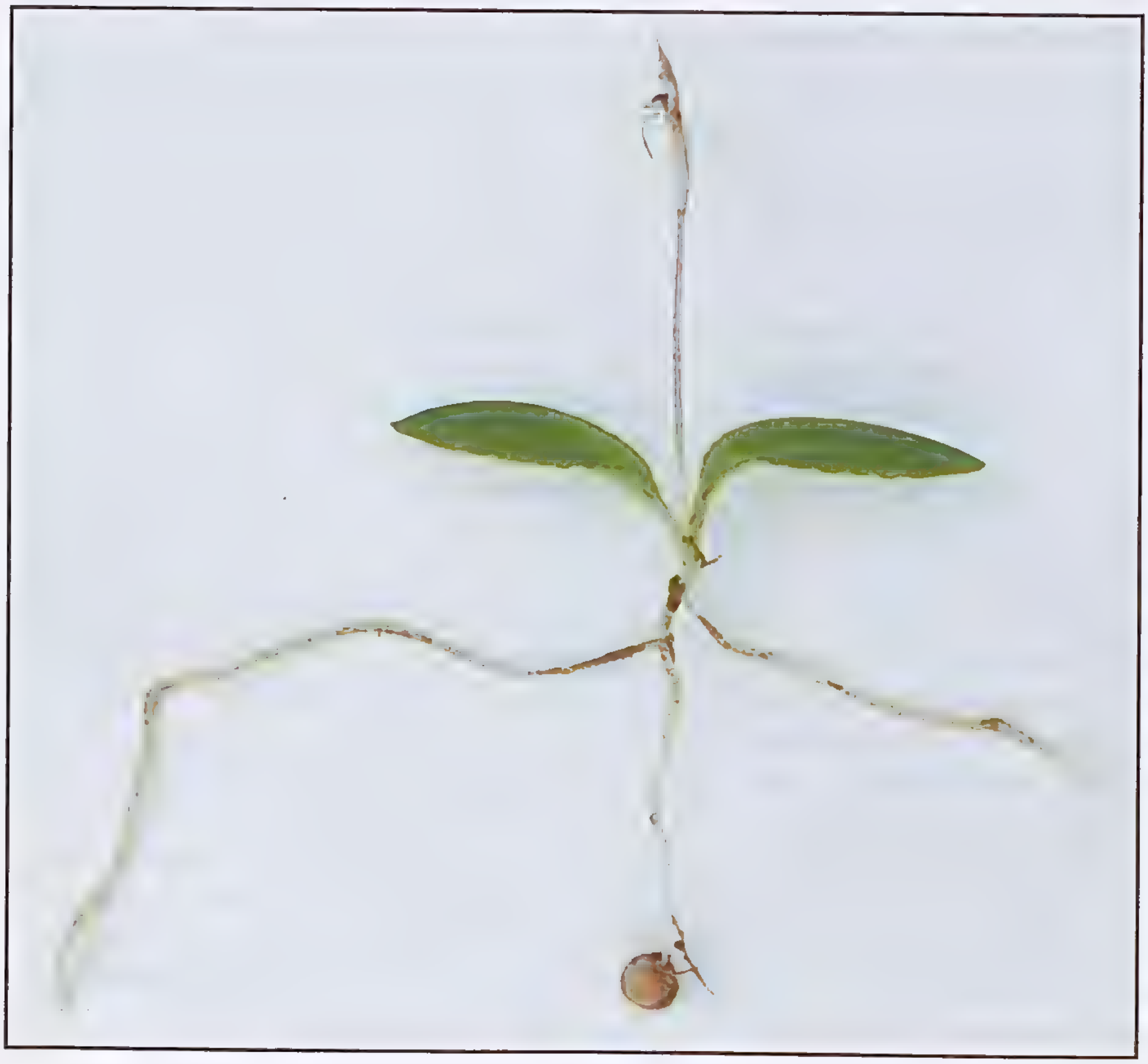
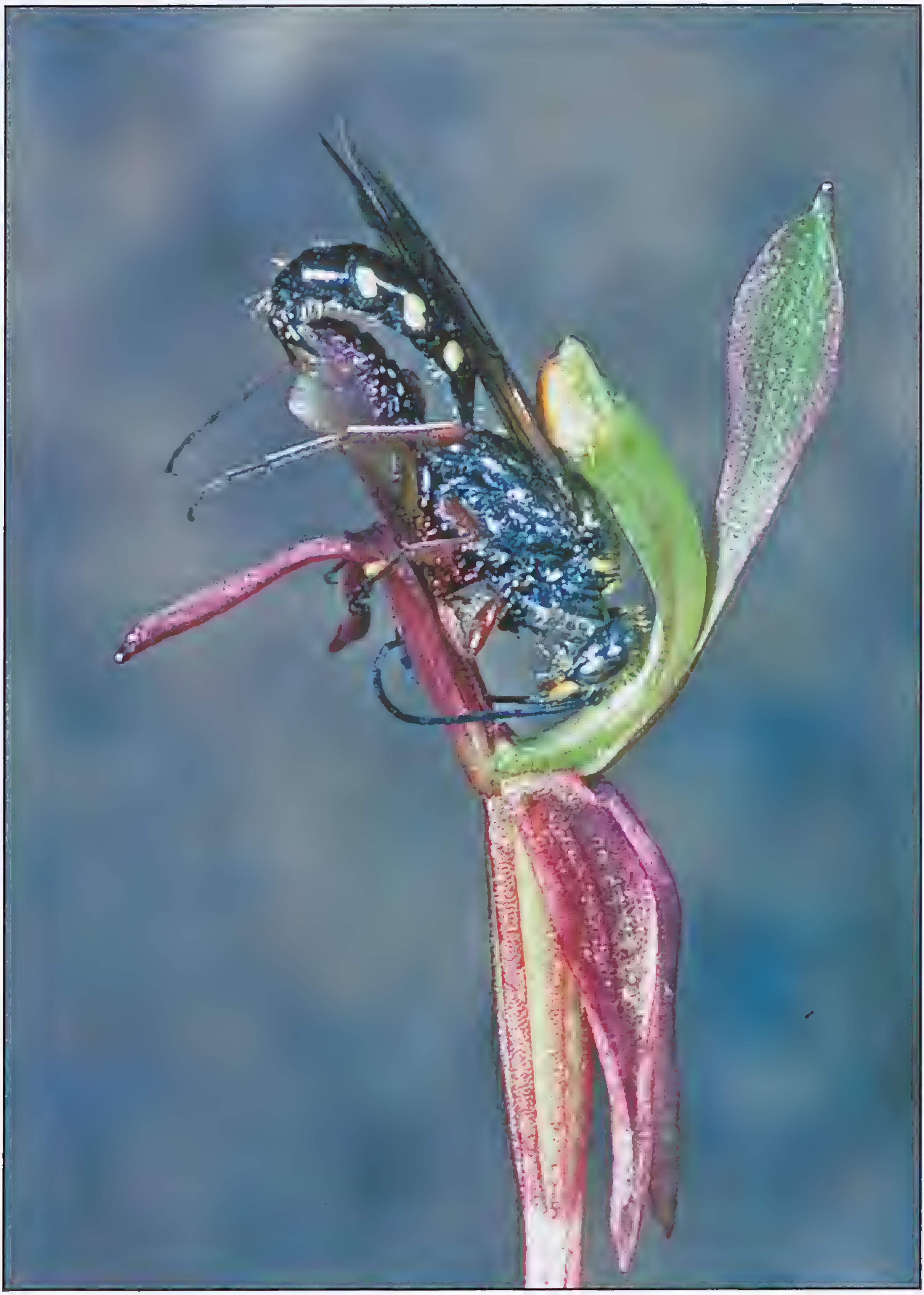


Plate 6. Plant of *Chiloglottis seminuda* showing the parent tuber below the leaves and flower stem, and two lateral roots which will later form the daughter tubers.



late 7. Male *Neozeleboria* species 45 pseudocopulating on the labellum of *Myrmechila* aff. *formicifera* 1. The wasp's forelegs are holding the decoy behind the head region while the genital claspers grip the labellum apex.

geographical and altitudinal boundaries is relatively common. However, despite some allomone sharing, in all known cases each orchid species has it own unique pollinator.

The knowledge that thynnine-pollinated sexually deceptive orchids typically have a single specific pollinator has been used to support the description of several new *Chiloglottis* alliance species, e.g. Carr (1991) used the findings of Stoutamire (1975) to support the description of *Chiloglottis grammata* (now *Simpliglottis grammata*). Similarly, Jones (1991) used pollinator information generated by the author to support the description of *Chiloglottis platyptera* (now *Myrmechila platyptera*), *C. pluricallata* (now *Simpliglottis pluricallata*), *C. seminuda* (now *M. seminuda*) and *C. valida* (now *S. valida*), as well as *C. jeanesii* (now *S. jeanesii*) (Jones 1997). In addition to having different pollinators, all these species, on close examination, are quite distinct morphologically and readily identifiable in the field.

The pollinators of eighteen of the twenty four described species in the *Chiloglottis* alliance have been collected and identified (Table 1). In addition, another eight undescribed species of *Chiloglottis* alliance orchids have been identified by virtue of their unique pollinators (Table 1). Some implications of the data in Table 1 are:

- Fifteen of the wasp species are unnamed, illustrating the enormous job still confronting entomologists to document Australia's insect diversity.
- Most of the pollinators belong to the thynnine genus *Neozeleboria* onto which the *Chiloglottis* alliance has radiated (Mant *et al.* 2005).
- *Chiloglottis diphylla* has attracted two species of *Arthrothynnus* in apparent contradiction of pollinator specificity. However, further investigation is needed to determine if the two wasp taxa are variants of the same species, or there are two cryptic orchid species within *C. diphylla* (see below).
- *Chiloglottis reflexa sensu stricto* from Tasmania has the same pollinator, *Neozeleboria proxima*, as mainland *C. trilabra* and is the same biological species. Mainland plants currently called *C. reflexa* have a different pollinator, *Neozeleboria* sp. 30, and are an undescribed species.

Cryptic Species

Although the eight undescribed orchid taxa in Table 1 consistently attract different pollinator species, many of them lack any morphological differences to reliably identify them in the field, or which can form the basis of a formal description. However, the pollinator evidence indicates they are separate entities that will not interbreed with others in the field. The absolute lack of genetic interchange that this implies is sufficient evidence to regard them as separate species. Such entities are referred to as cryptic species. There are two well-documented examples among the taxa in Table 1.

1. ***Myrmechila* aff. *formicifera* 1 and *M.* aff. *formicifera* 2.** These two taxa in the *Myrmechila formicifera* complex occur in mixed colonies in sheltered gullies and on shady slopes in the Stanthorpe to Tenterfield area of the Granite Belt on the NSW / Qld. border. Tests with identical looking flowers from near Bald Rock in NSW and Wyberba in Qld showed both populations contained flowers that attracted one or the other of two different wasp species as pollinators, but never both. The two taxa,, designated *M.* aff. *formicifera* 1 and 2, are pollinated by *Neozeleboria* new species 45 and *N.* near new species 40, respectively. However, when translocated to the habitats of *M. formicifera*, *M.* aff. *formicifera* 1 attracts the *M. formicifera* pollinator, *N.* new species 41, which is closely

related to, and appears to have the same or similar attractant odours to, *N.* new species 45.

2. ***Simpliglottis valida*, *S. aff. valida* 1 and *S. aff. valida* 2.** Flowers from thirty eight different populations thought to be *Simpliglottis valida* from southern NSW and across Victoria were found to attract four different species of thynnine wasps in pollinator choice tests (Bower 2006). The tests showed the orchids and pollinators belonged to two odour types, with two wasps in each type. The two wasps in each odour type were separated spatially by altitude, so that one wasp of each type occurred above about 1000 m with the other pair below 1000 m. There were two cryptic orchid taxa above 1000 m pollinated by the two high altitude wasps, which themselves were cryptic species within *Neozeleboria monticola*. The two high altitude orchids and wasps cannot be reliably distinguished morphologically in the field. It was only apparent that two different odour types were involved when the high altitude orchids were tested at low altitudes and attracted morphologically distinct wasps which shared the same or similar pheromones as the high altitude species. The study revealed three cryptic species within *S. valida*; true *S. valida* pollinated by *N. monticola*, which mainly occurs at medium to high altitudes, *S.* aff. *valida* 2 pollinated by *N.* near *monticola*, at altitudes of above 1000 m, and *S.* aff. *valida* 1, pollinated by *N.* near *impatiens* at altitudes below about 1000 m. *N.* near *monticola* and *N.* near *impatiens* have the same or very similar sex pheromones, as do *S.* aff. *valida* 1 and *S.* aff. *valida* 2.

These scenarios show the kind of complexity that is unfolding in sexually deceptive pollination systems.

Subsequent articles will discuss each of the *Chiloglottis* alliance species, including the undescribed ones, with one article for each of the three genera currently recognised.

References

Bower, C.C. (1992). The use of pollinators in the taxonomy of sexually deceptive orchids in the subtribe Caladeniinae (Orchidaceae). *The Orchadian*, **10**, 331-338.

Bower, C.C. (1996). Demonstration of pollinator-mediated reproductive isolation in sexually deceptive species of *Chiloglottis* (Orchidaceae: Caladeniinae). *Australian Journal of Botany*, **44**, 15-33.

Bower, C.C. (2006). Specific pollinators reveal a cryptic taxon in the bird orchid, *Chiloglottis valida sensu lato* (Orchidaceae) in south-eastern Australia. *Australian Journal of Botany*, **54**, 53-64.

Bower, C.C. and Brown, G.R. (1997). Hidden biodiversity: Detection of cryptic thynnine wasp species using sexually deceptive, female-mimicking orchids. *Memoirs of the Museum of Victoria*, **56**, 461-466.

Carr, G.W. (1991). New taxa in *Caladenia* R. Br., *Chiloglottis* R. Br. and *Gastrodia* R. Br. (Orchidaceae) from South eastern Australia. *Indigenous Flora and Fauna Association Miscellaneous Paper*, **1**, 1-25.

Clements, M.A. (1989). Catalogue of Australian Orchidaceae. *Australian Orchid Research*, **1**, 1-160.

Dockrill, A.W. (1956). The cross-pollination of *Chiloglottis formicifera* Fitzg. *The Australian Orchid Review*, March, pp. 26-7.

Fitzgerald, R.D. (1877). *Australian Orchids*. Volume 1, Part 3. Government Printer, Sydney.

Giles, K. (1964). An interesting observation. *The Orchadian*, **1**,

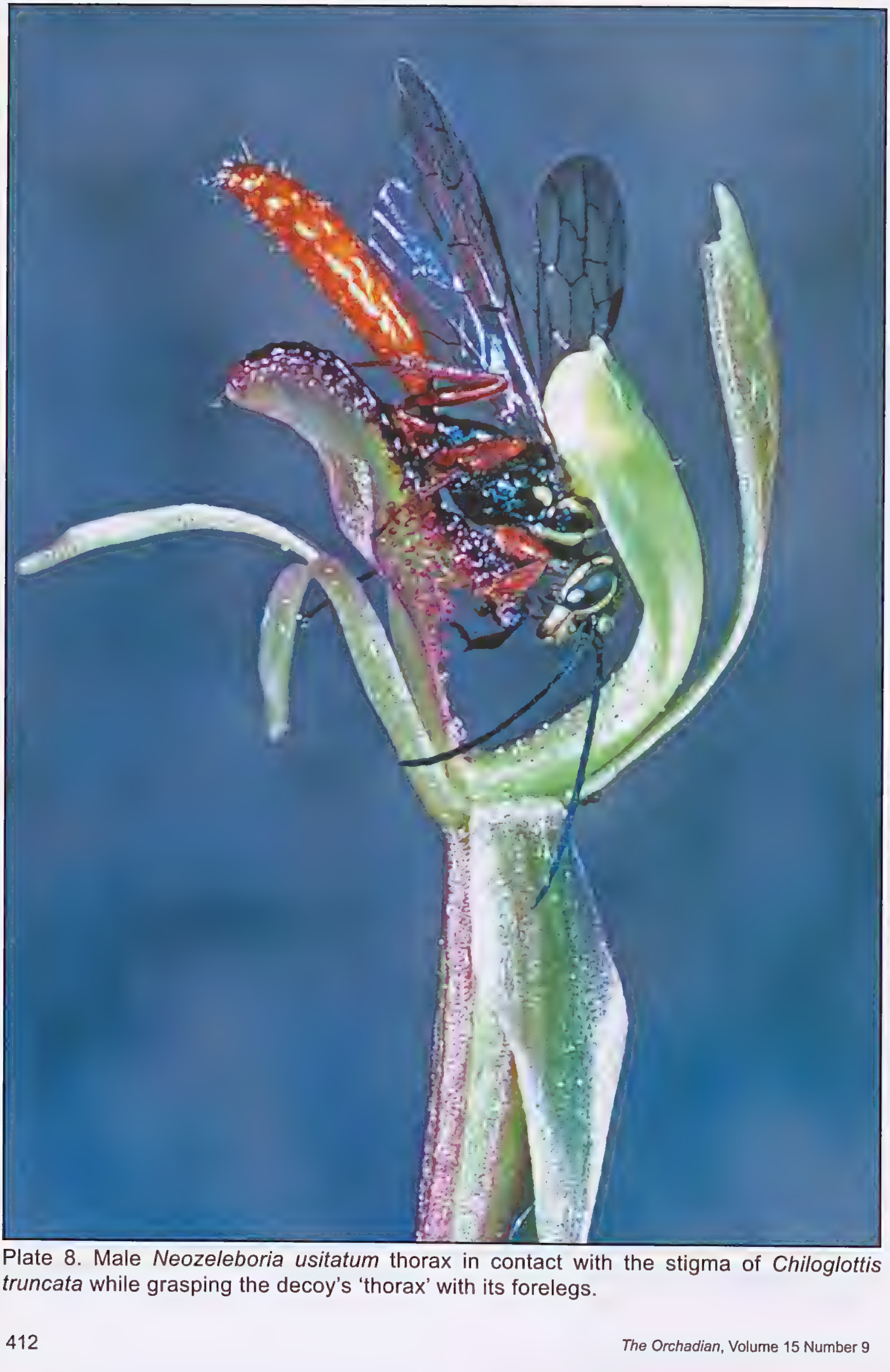


Plate 8. Male *Neozeleboria usitatum* thorax in contact with the stigma of *Chiloglottis truncata* while grasping the decoy's 'thorax' with its forelegs.

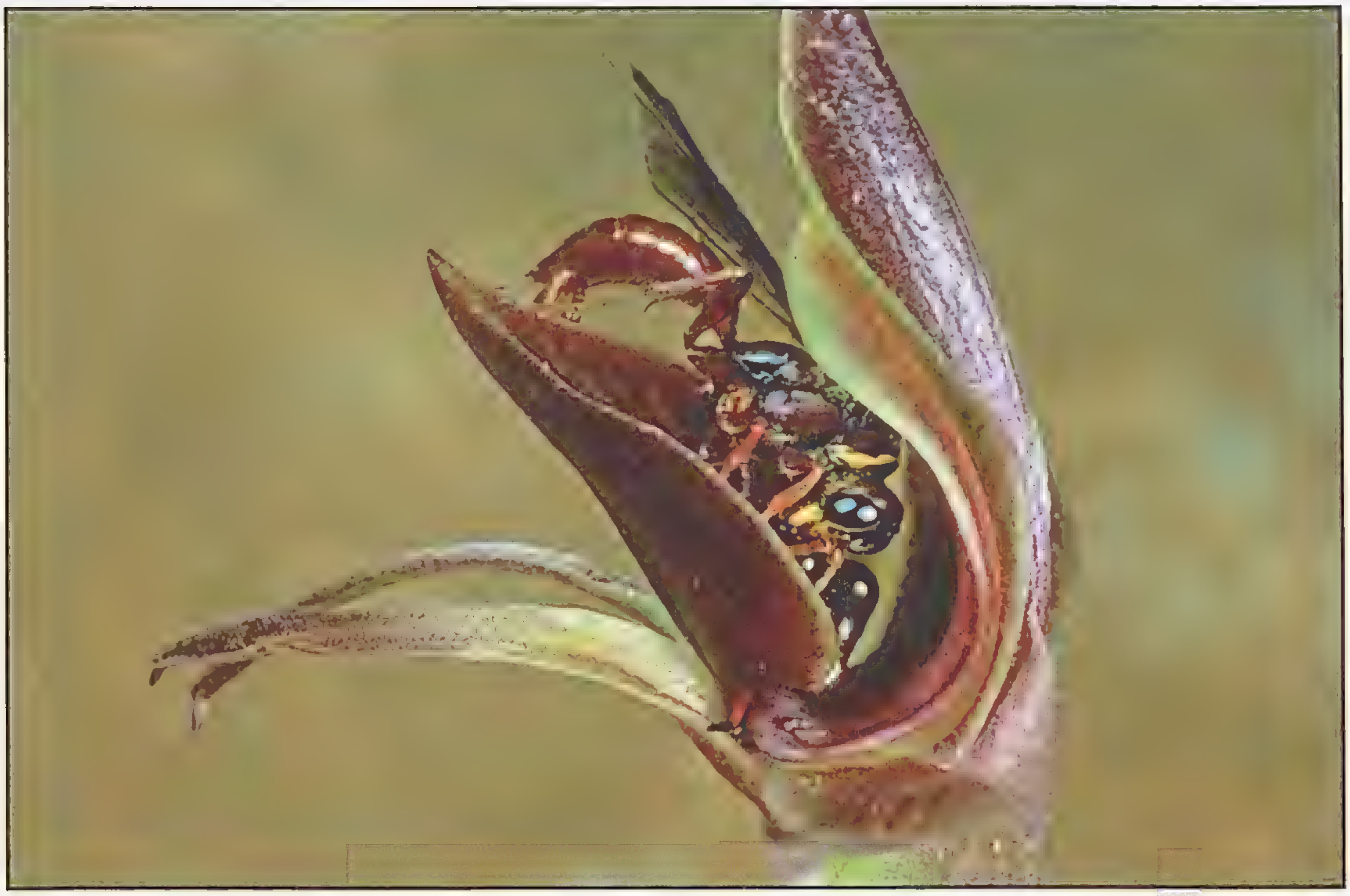


Plate 9. Male *Eirone* sp. attempting to couple with the labellum of *Simpliglottis grammata*.

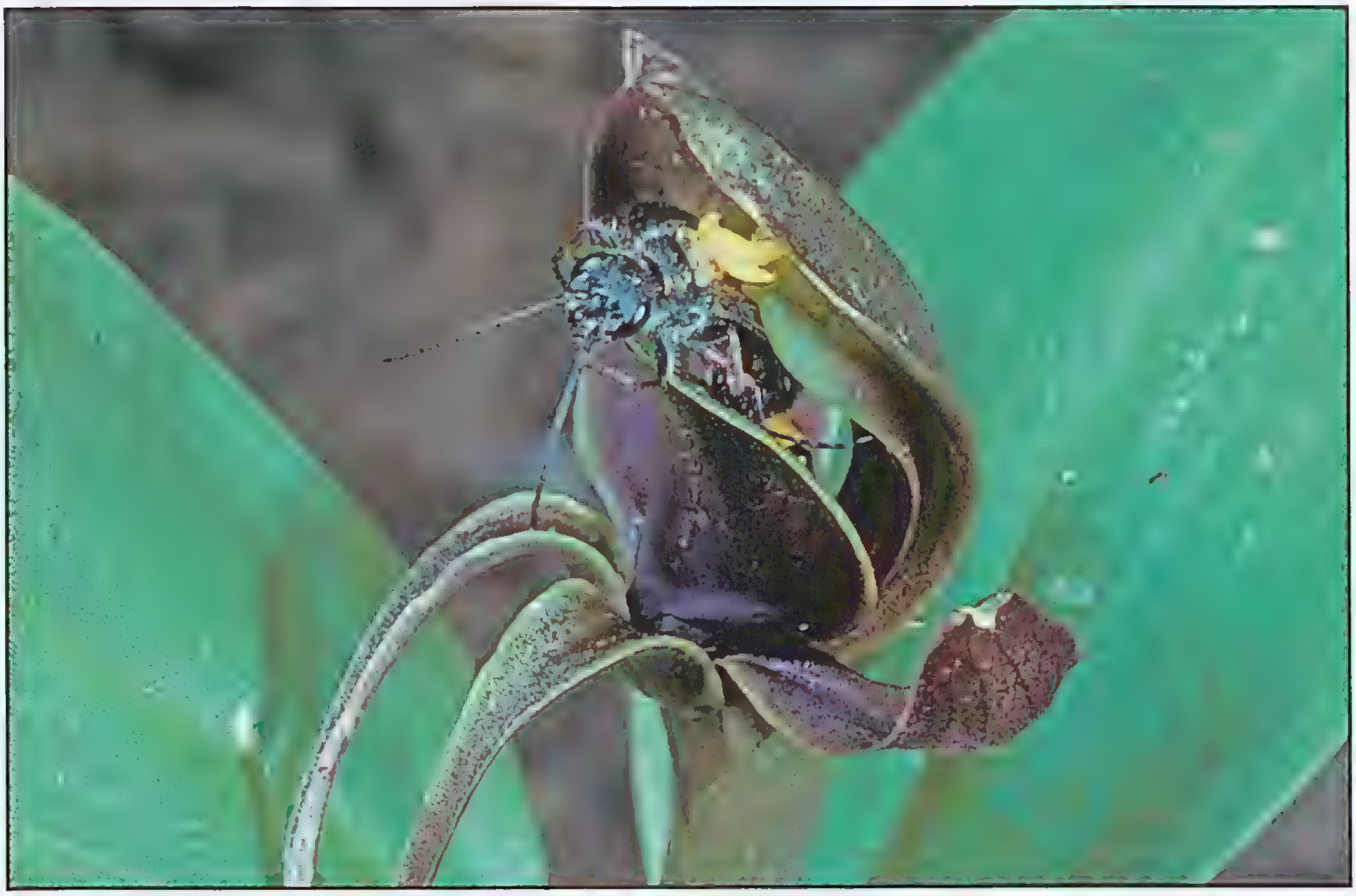


Plate 10. Male *Neozeleboria monticola* emerging with pollinia from between the labellum and column of *Simpliglottis valida*.

114.

Jeanes, J.A. (2002). Some new combinations and a new hybrid genus in Orchidaceae: Diurideae, for eastern Australia. *Muelleria*, **16**, 81-82.

Jones, D.L. (1991). New taxa of Australian Orchidaceae. *Australian Orchid Research*, **2**, 1-208.

Jones, D.L. (1997). *Chiloglottis jeanesii* (Orchidaceae), a new species from Victoria. *Muelleria*, **10**, 63-67.

Jones, D.L. (1998). Contributions to Tasmanian orchidology - 3: A taxonomic review of *Chiloglottis* R. Br. in Tasmania. *Australian Orchid Research*, **3**, 61-71.

Jones, D.L. (2002). Nomenclatural notes arising from studies into the Tribe Diurideae (Orchidaceae). *The Orchadian*, **13**, 437-468.

Jones, D.L. (2006a). *A Complete Guide to the Native Orchids of Australia*. Reed New Holland, Sydney.

Jones, D.L. (2006b). Miscellaneous new species of Australian Orchidaceae. *Australian Orchid Research*, **5**, 45-111.

Jones, D.L. and Clements, M.A. (2005). Miscellaneous nomenclatural notes and changes in Australian, New Guinea and New Zealand Orchidaceae. *The Orchadian*, **15**, 33-42.

Mant, J.G., Schiestl, F.P., Peakall, R. and Weston, P.H. (2005a). A phylogenetic study of pollinator conservatism among sexually deceptive orchids. *Evolution*. **56**, 888-898.

Mant, J.G., Bower, C.C., Weston, P.H. and Peakall, R. (2005b). Phylogeography of pollinator-specific sexually deceptive *Chiloglottis* taxa (Orchidaceae): evidence for sympatric divergence? *Molecular Ecology*, **14**, 3067-3076.

Peakall, R. and Handel, S.N. (1993). Pollinators discriminate among floral heights of a sexually deceptive orchid: implications for selection. *Evolution*, **47**, 1681-1687.

Peakall, R., Bower, C.C., Logan, A.E. and Nicol, H.I. (1997). Confirmation of the hybrid origin of *Chiloglottis* × *pescottiana* (Orchidaceae: Diurideae). 1. Genetic and morphometric evidence. *Australian Journal of Botany*, **45**, 839-855.

Peakall, R., Jones, L., Bower, C.C. and Mackey, B.G. (2002) Bioclimatic assessment of the geographic and climatic limits to hybridisation in a sexually deceptive orchid system. *Australian Journal of Botany*, **50**, 1-10.

Schiestl, F.P., Peakall, R., Mant, J.M., Ibarra, F., Schulz, C., Francke, S. and Francke, W. (2003). The chemistry of sexual deception in an orchid-wasp pollination system. *Science*, **302**, 437-438.

Schiestl, F.P. and Peakall, R. (2005). Two orchids attract different pollinators with the same floral odour compound: ecological and evolutionary implications. *Functional Ecology*, **19**, 674-680.

Stoutamire, W. P. (1975). Pseudocopulation in Australian terrestrial orchids. *American Orchid Society Bulletin*, **44**, 226-233.

Szlachetko, D.L. (2001). Genera *et* Species Orchidalium. 1 *Polish Botanical Journal*, **46**, 11-26.

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Table 1
Pollinators of Taxa in the *Chiloglottis* Alliance

Orchid taxon	Confirmed pollinator	Probable pollinator
Chiloglottis		
C.anaticeps		*N.* ? sp. 33
C. diphylla	*Arthrothynnus latus* *A. angustus*	
C. palachila	*Chilothynnus palachilus*	
C. reflexa s.s. (Tas.)	*Neozeleboria proxima*	
C. aff. *reflexa* (mainland)	*N.* sp. 30	
C. seminuda	*N.* sp. 29	
C. sphyrnoides	*N.* sp. 3	
C. sylvestris		*N.* sp. 50
C. trilabra	*N. proxima*	
Myrmechila		
M. formicifera	*N.* sp. 41	
M. aff. *formicifera* 1	*N.* sp. 45	
M. aff. *formicifera* 2	*N.* sp. near 40	
M. platyptera		*N.* sp. 40
M. trapeziformis	*N. cryptoides*	
M. truncata		*N. usitatum*
Simpliglottis		
S. grammata	*Eirone leai*	
S. jeansii	*N.* nr. *impatiens* 2	
S. pluricallata s.s.		*N.* sp. near 41
S. aff. *pluricallata* 1	*N. tabulata*	
S. aff. *pluricallata* 2	*N.* nr. *monticola* 2	
S. aff. *pluricallata* 3		*N. impatiens*
S. triceratops	*N. carinicollis*	
S. turfosa	*N.* nr. *monticola* 1	
S. valida	*N. monticola*	
S. aff. *valida* 1	*N.* nr. *impatiens* 3	
S. aff. *valida* 2	*N.* nr. *monticola* 3	

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107 Roberts St   Essendon Vic. 3040 Australia.
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Plate 11. Samples of *Simpliglottis* flowers in vials of water placed on the ground to attract pollinators.

Plate 12. The author conducting a pollinator choice test.

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New taxa of *Dendrobium* Swartz section *Biloba* J.J.Smith from New Guinea.

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ABSTRACT. Four new species of *Dendrobium* section *Biloba* are named, described and illustrated, namely *D. aethalodes, D. hooglandianum, D. hooveri* and *D. pullenianum.* A brief overview of section *Biloba* is supplied.

Dendrobium section *Biloba* is currently a group of about 30 species distributed from Sulawesi to Fiji, with the centre of speciation being New Guinea (26 species). The group was previously well known as section *Monanthos* Schltr., which was described in November 1905 (Schlechter 1905), typified by *Dendrobium bilobum* Lindl., and elevated to generic rank by Brieger (1981). However, J.J. Smith (1905) had named it one month earlier than Schlechter, in October 1905, as section *Biloba.*

The section is characterized by having slender leafy stems, one-flowered inflorescences and nonresupinate flowers lasting few to several days with free lateral sepals forming a subglobose to conical mentum. Listed below are the known taxa (except varieties) with the distribution stated only if the plant originates from outside New Guinea or the Bismarck Archipelago.

Besides the entities described here, the known species are: *D. agrostophylloides* Schltr., *D. aridum* J.J.Sm., *D. bilobum* Lindl. (New Guinea to Vanuatu?), *D. corticicola* Schltr., *D. crassinervium* J.J.Sm., *D. crenatilabre* J.J.Sm. (var. *seranicum* J.J.Sm. occurs on Ceram), *D. erectifolium* J.J.Sm., *D. gracilicaule* Krzl. (1893, not of F.Mueller 1859), *D. integrum* Schltr., *D. isochiloides* Krzl., *D. koordersii* J.J.Sm. (Ambon to Sulawesi), *D. lamproglossum* Schltr., *D. macrum* Schltr., *D. malbrownii* Dockr. (NE Australia), *D. montedeakinense* Bailey, *D. nidificum* Krzl., *D. obovatum* Schltr., *D. papiliolabratum* van Royen, *D. piestocaulon* Schltr., *D. planicaule* Ridl., *D. poneroides* Schltr., *D. procerum* Schltr., *D. rhytidothece* Schltr., *D. rickscottianum* O'Byrne & J.J.Vermeulen (Sulawesi), *D. roseoflavidum* Schltr. (1912, not of Schltr. 1923), *D. subbilobatum* Schltr., *D. subserratum* Schltr., *D. unicarinatum* Kores (Fiji), *D. vinosum* Schltr. and *D. xanthothece* Schltr.

The present paper is the result of herbarium studies conducted at the Harvard University Herbaria (HUH). Another six undescribed taxa of section *Biloba* were identified during this work and these will be described shortly.

Dendrobium aethalodes Ormerod, *sp. nov.*
Type: Indonesia – Papua Prov., 15 km SW of Bernhard Camp, Idenburg River, 1800 m, January 1939, *L.J.Brass 12424* (holotype: AMES!).
Affinis D. subbilobatum Schltr. *sed foliis leviter angustioribus (3.5-4 vs. 4-5 mm), in sicco semi-involutis (non planis) et callus labello floribus tricarinatis (non unicarinatis) differt.*

Epiphytic herb. Rhizome terete, strongly sclerified, covered in brownish sheaths which decay into fibrous remnants, 0.15-0.3 cm thick. Roots terete, fleshy, 0.15-0.3 cm thick. Stems pendent, close together, terete, lower third leafless, upper two-thirds laxly leafly, 45.7-49.1 cm long, 0.09-0.17 cm thick; internodes 1-4.2 cm long, covered by truncate sheaths which are smooth, finely striate and yellow spotted with brown to black, older sheaths apparently becoming finely rugulose. Leaves linear-lanceolate, inequally obtusely to acutely bilobed at apex, stiffly coriaceous, almost smooth to minutely transversely rugulose above, green suffused with sooty black (probably from an epiphyllous fungus) above, smooth and green below, 5.5-8.6 cm long, 0.35-0.4 cm wide. Inflorescence emerging through leaf sheath about halfway along its length; peduncle terete, short, 1.5 mm long. Pedicellate ovary terete, shallowly sulcate, 5 mm long. Flowers fleshy, bright sulphur yellow, or yellow with the lip tinged red and the column red. Dorsal sepal oblong-elliptic, obtuse, 3-veined, 7 mm long, 4 mm wide. Lateral sepals somewhat transversely rectangular, obtuse, 7-veined, 7 mm long, 9 mm wide, forming with the columnfoot a mentum 6 mm long. Petals obliquely ligulate-subrhombic, subacute, 3-veined, 7 mm long, 1.95 mm wide. Labellum obdeltate, bilobed, apex obtuse; sidelobes obliquely triangular-subfalcate, front edge truncate, apex subacute; callus oblong, thickly tricarinate, at each side of the base with a thick oblique extension onto the sides of the lip, obliquely truncate at base and apex; immature lip 5.5 mm long medially, 8.5 mm long to tips of sidelobes, 7 mm wide. Column conical, 3.8 mm long (including anther cap); columnfoot 5.5-6 mm long. Capsule obovoid, 7.5 mm long.

Distribution: Indonesia (Papua); Papua New Guinea.

Habitat: High canopy epiphyte in lower montane mossy forest, 1800-2300 m.

Etymology: The specific epithet is derived from the Greek *aethalodes* meaning sooty, referring to a sooty suffusion observed on the leaves of both known collections.

Additional specimen examined: Papua New Guinea – Central District, East Mt. Tafa, 2300 m, 27 May 1933, *L.J.Brass 4089* (AMES).

Notes: This species is closely related to the Papua New Guinean *D. subbilobatum* Schltr. [non-type reference specimen, *Ledermann 9424* (K!)] but it differs from the latter in having relatively narrower (3.5-4 vs. 4-5 mm) leaves and flowers that have a tricarinate (not unicarinate) labellum callus with basal extensions connate to the sides of the lip. A relatively complex callus of this type has not been previously reported in section *Biloba.*

The description of the labellum is from an immature flower since that segment was lacking from mature flowers.

Dendrobium hooglandianum Ormerod, *sp. nov.*

Type: Papua New Guinea – Western Highlands Prov., near Wankl Village, on mountain slope, ca. 5 km SE of Mt. Hagen Station, 2150-2195 m, 17 August 1956, *R.D.Hoogland & R.Pullen 5950* (holotype: AMES!).

Affinis D. crassinervium J.J.Sm. *sed petalis floribus ad basi leviter incrassatis (non nervis incrassatis) et epichilo labello transverse ruguloso (non puberulo-papillosis) differt.*

Epiphytic herb. Rhizome not seen. Roots terete, fleshy, 0.3 cm thick. Stems terete basally, becoming complanate above, lower third leafless, upper two-thirds leafy, 49.7-65.5 cm long, 0.15-0.4 cm thick; internodes 2.1-3.3 cm long, 0.4-0.6 cm wide (including sheaths), covered with finely striate and minutely transversely rugulose sheaths which are terminated by a short broadly triangular lobule 0.1-0.15 cm long. Leaves oblong-ligulate, inequally obtusely bilobed at apex, coriaceous, smooth, 6.7-9.4 cm long, 1.3-1.35 cm wide. Inflorescence emerging through leaf sheaths opposite base of leaf blade; peduncle very short. Pedicellate ovary obconical, 5-6 mm long. Flowers purple. Dorsal sepal oblong-elliptic, obtuse, inside apex subcalceolate, 5-veined, 11.5-12 mm long, 4.9 mm wide. Lateral sepals obliquely and broadly ovate-elliptic, obtuse, inside apex subcalceolate, 9-veined, 11.5 mm long, 7 mm wide, forming with the columnfoot a mentum 6 mm long. Petals obliquely obovate, obtuse, basal quarter fleshy, with 3 main veins that have supplementary branches, 11 mm long, 4.95-5 mm wide. Labellum trilobed, rigidly arcuate, fleshy, ca. 8 mm long, 5 mm wide; hypochile obcuneate, with narrow, apically incurved sidelobes, 4 mm long, 5 mm wide; epichile suborbicular, fleshy, transversely rugulose on margins and below apex, 4 mm long, 4-4.5 mm wide; callus barely discernible, slightly raised basally. Column broadly and obliquely conical, 2-2.5 mm long; columnfoot ca. 6 mm long. Capsule not seen.

Distribution: Papua New Guinea, known only from the type locality.

Habitat: On branches of a tall tree in lower montane forest, 2150-2195 m.

Etymology: The specific epithet honours Ru Hoogland, who collected the type of this species with Roy Pullen.

Notes: This species seems to be most closely related to the West New Guinean *D. crassinervium* J.J.Sm. but it has longer (6.7-9.4 vs. 4.5 cm) leaves, flowers with obliquely obovate (not oblong-subrhombic) petals uniformly thickened (not just the 3 veins) basally and a lip epichile with transversely rugulose (not papillose-puberulent) edges.

Dendrobium hooveri Ormerod, *sp. nov.*
Type: Papua New Guinea – West Sepik Prov., Carpentaria Exploration Base Camp, Nena forest area, M100 to M101 helipad, 750-830 m, January 1978, *W.S.Hoover 937* (holotype: A!).
Affinis D. agrostophylloides Schltr. *sed foliis brevioribus (2.6-5.7 vs. 8-10 cm) et epichilo labello floribus papilloso-asperatis (non verruculosis) differt.*

Habit not known. Rhizome and roots not seen. Stems terete basally, becoming complanate above, leafy throughout, 25-39.2 cm long, 0.075-0.4 cm thick; internodes 1.5-1.8 cm long, 0.3-0.5 cm wide (including sheaths), covered with obliquely truncate, smooth, finely striate sheaths. Leaves oblong-ligulate, inequally obtusely bilobed at apex, coriaceous, smooth, 1.1-5.7 cm long, 0.2-1 cm wide. Inflorescence emerging through base of leaf sheaths opposite the leaves; peduncle very short. Pedicellate ovary clavate-obconical, 4.5-5 mm long. Flower colour not known. Dorsal sepal ovate-elliptic, obtuse, 7-veined, 10.1 mm long, 4.5 mm wide. Lateral sepals obliquely ovate, obtuse, 7-veined, 11 mm long, 8 mm wide, forming with the columnfoot a mentum 6.5 mm long. Petals oblong, weakly sublobulate along lower margin, obtuse, 3-veined, 9 mm long, 3.4 mm wide. Labellum trilobed, fleshy, 8.5 mm long, 4 mm wide; hypochile with narrow sidelobes, at apex each side obliquely truncate, subacute; epichile broad-ovate, obtuse, upper side at base with a small excavation, surface finely papillose-asperate, 3 mm long, 3-4 mm wide; callus with a free ellipsoid-subglobose basal projection, otherwise oblong-ligulate, low and smooth. Column broadly conical, truncate, 2 mm long; columnfoot 6.5 mm long. Capsule not seen.

Distribution: Papua New Guinea, known only from the type locality.

Etymology: The specific epithet honours W. Scott Hoover, collector of both known specimens.

Additional Specimen examined:
Papua New Guinea – West Sepik Prov., Carpentaria Exploration Base Camp, Nena forest area, M100 to M101 helipad, 750-830 m, January 1978, *W.S.Hoover 925* (A).

Notes: This species appears to be closely related to *D. agrostophylloides* Schltr. since it has flowers about the same size, oblong petals with an indistinct lobe on the lower margin and a similarly shaped lip. However *D. hooveri* differs from *D. agrostophylloides* in having shorter (2.6-5.7 vs. 8-10 cm) leaves, flowers with a mentum that is twice as long (6.5 vs. 3 mm) and a lip epichile with a finely papillose-asperate (not verruculose) surface.

Another very similar species appears to be the West New Guinean *D. crassinervium* J.J.Sm. that has broader (14.5-16.5 vs. 2-10 mm) leaves, flowers with a broader (6.25 vs. 4.5 mm) dorsal sepal, broader (11.25 vs. 8 mm) lateral sepals, broader (5 vs. 3.4

mm) petals with three basally thickened (vs. unthickened) veins and the lip epichile lacking a basal excavation.

Dendrobium pullenianum Ormerod, *sp. nov.*
Type: Papua New Guinea – Western Highlands Prov., near Wankl Village, on mountain slope, ca. 5 km SE of Mt. Hagen Station, 2150-2195 m, 17 August 1956, *R.D.Hoogland & R.Pullen 5947* (holotype: AMES!).
Affinis D. corticicola Schltr. *sed floribus lacteum et purpureo-punctatum (non sulphureis), grandioribus (sepalis 13.5-15 vs. 7 mm) et epichilo labello glabro (non minutissime papillosis) differt.*

Epiphytic herb. Rhizome terete, strongly sclerified, 0.23 cm thick. Roots terete, fleshy, 0.25 cm thick. Stems terete basally, becoming complanate above, close together, leafy in upper half, to 107 cm long, 0.2-0.5 cm thick; internodes 1.3-3 cm long, covered by smooth, striate, 1-3 cm long sheaths which terminate in a broadly triangular 0.3-0.5 cm long lobule opposite the insertion of the leaf blade. Leaves oblong, inequally obtusely bilobed at apex, coriaceous, smooth, 3.6-4.85 cm long, 1.1-1.25 cm wide. Inflorescence emerging through leaf sheath about halfway along its length; peduncle very short. Pedicellate ovary obconical-subclavate, 6 mm long. Flowers with sepals creamy outside, dotted purple inside, petals creamy with numerous purple dots on both sides, lip with still more numerous purple dots. Dorsal sepal oblong, obtuse, 7-veined, 13.5 mm long, 4.5 mm wide. Lateral sepals obliquely ovate-elliptic, obtuse, 7-veined, 15 mm long, 7 mm wide, forming with the columnfoot a mentum 6.5 mm long. Petals oblong, upper margin narrowed near the base, obtuse, with 3 main veins that have supplementary branches, 13 mm long, 4.5 mm wide. Labellum trilobed, fleshy, 8-8.5 mm long, 3.5 mm wide (unspread); hypochile rectangular, with thin, narrow sidelobes each of which have an oblique apex, 4 mm long, 3.5 mm wide (unspread); epichile ovate, subacute, anterior edge obliquely beveled, inside raised edges with caruncuIate accretions, otherwise glabrous, 4.5 mm long, 3 mm wide. Column obliquely conical, 3 mm long; columnfoot 6.5 mm long. Capsule not seen.

Distribution: Papua New Guinea, known only from the type locality.

Habitat: Epiphyte on branches of a tall tree in lower montane forest, 2150-2195 m.

Etymology: The specific epithet honours Roy Pullen, who collected the type of this species with Ru Hoogland.

Notes: This species appears to be most closely related to *D. corticicola* Schltr. but it has wider (11-12.5 vs. 6-8 mm) leaves, larger (sepals 13.5-15 vs. 7 mm) creamy-coloured flowers much spotted with purple (not sulphur yellow flowers) and a lip epichile that is glabrous (not minutely papillose) though it does have some caruncuIate accretions on the upper surface.

Acknowledgements.
I wish to thank herbarium and library staff at the Harvard University Herbaria for their help during my visits. Jeff Wood (K) kindly supplied images of material held at Kew.

Literature Cited.

Brieger, F.G. (1981) Subtribus Dendrobiinae. Pages 636-752, in F.G. Brieger, R. Maatsch & K. Senghas (eds.), *Schlechter, Die Orchideen, 3 Auflage, Band 1.* Paul Parey, Berlin.

Schlechter, R. (1905) Orchidaceae. Pages 69-234, in K. Schumann & K. Lauterbach (eds.), *Flora der Deutschen Schutzgebiete in der Sudsee.* Nachtrage, Vol. 2.

Smith, J.J. (1905) *Die Orchideen von Ambon.* Landsdrukkerij, Batavia.

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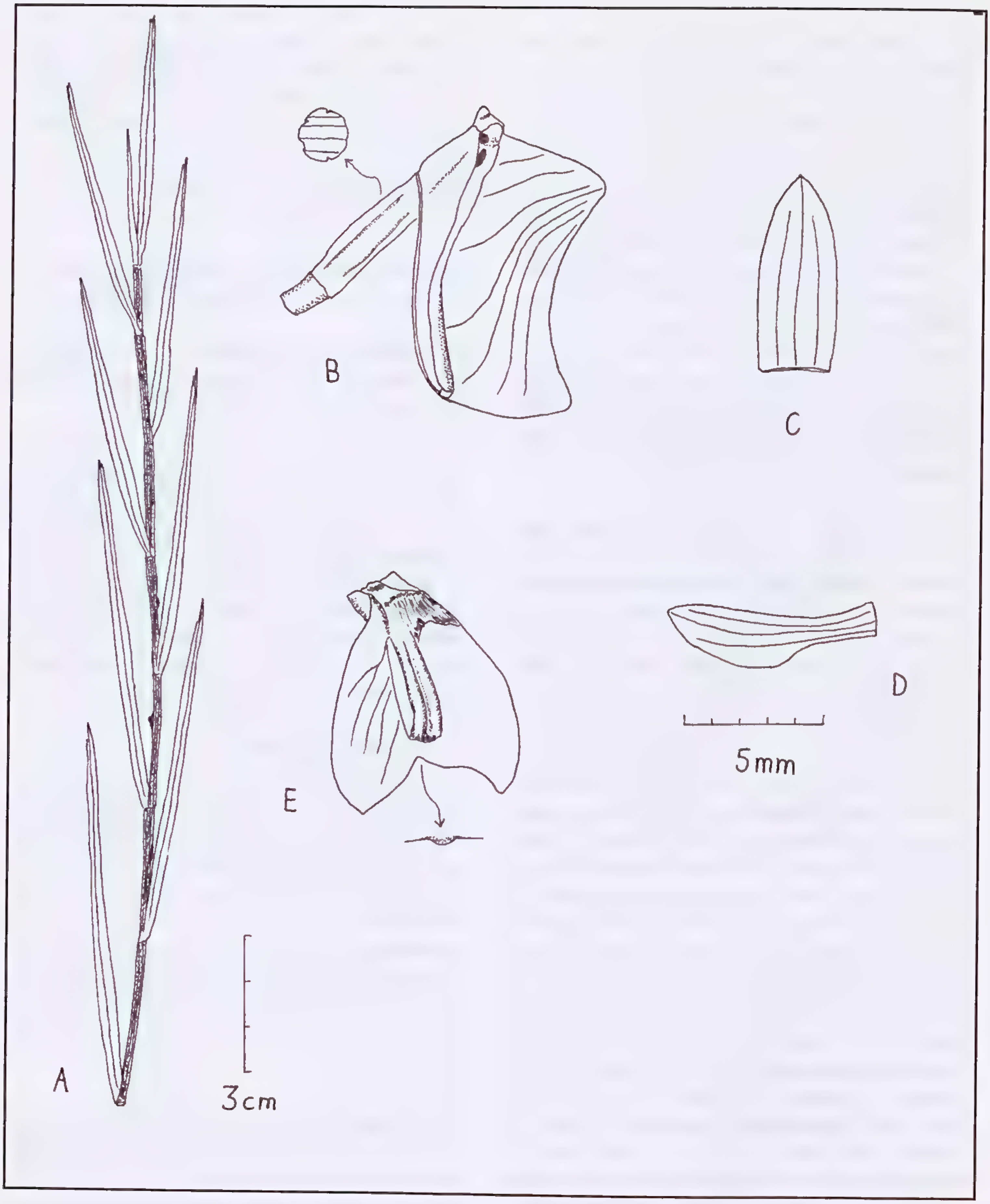
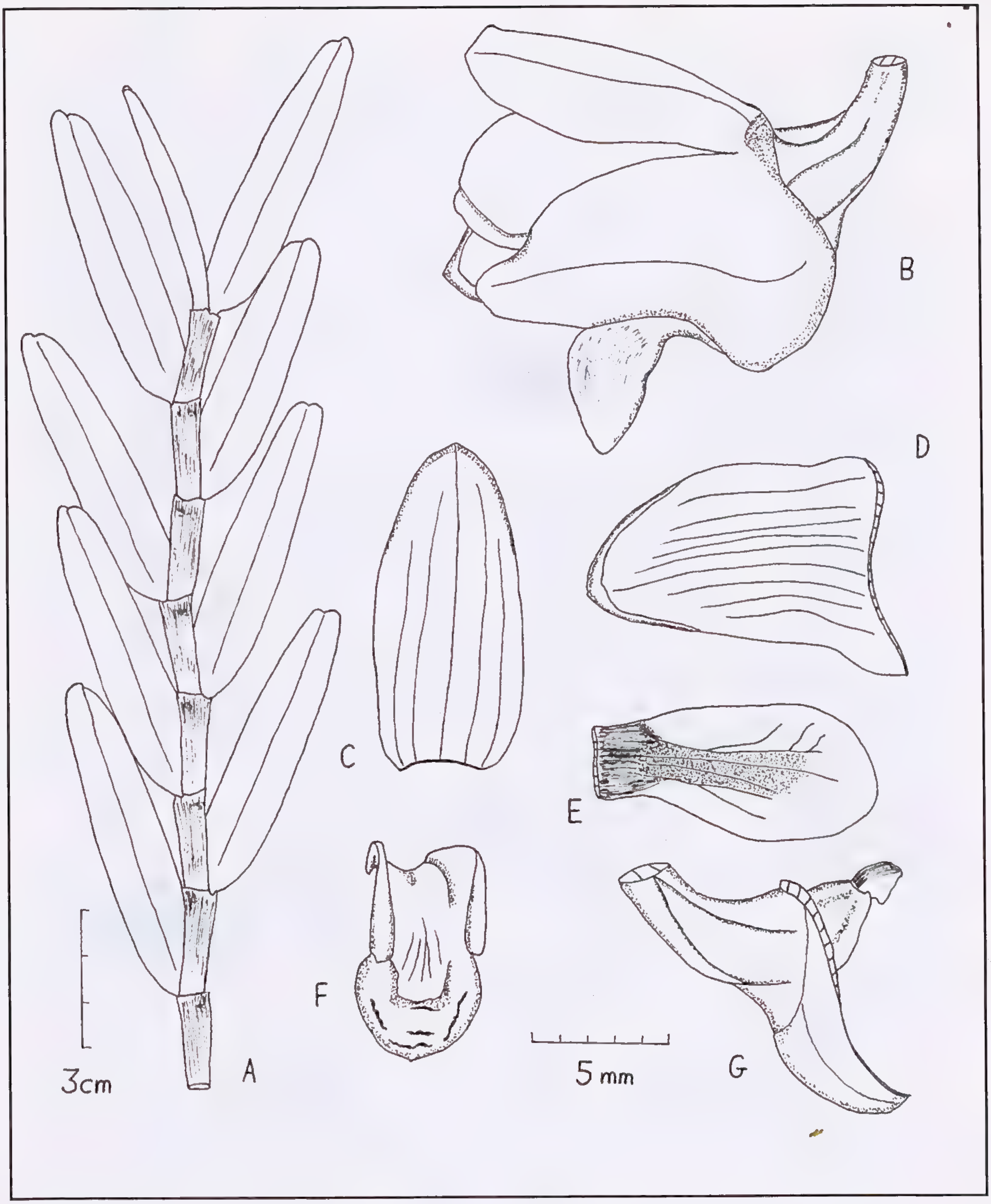
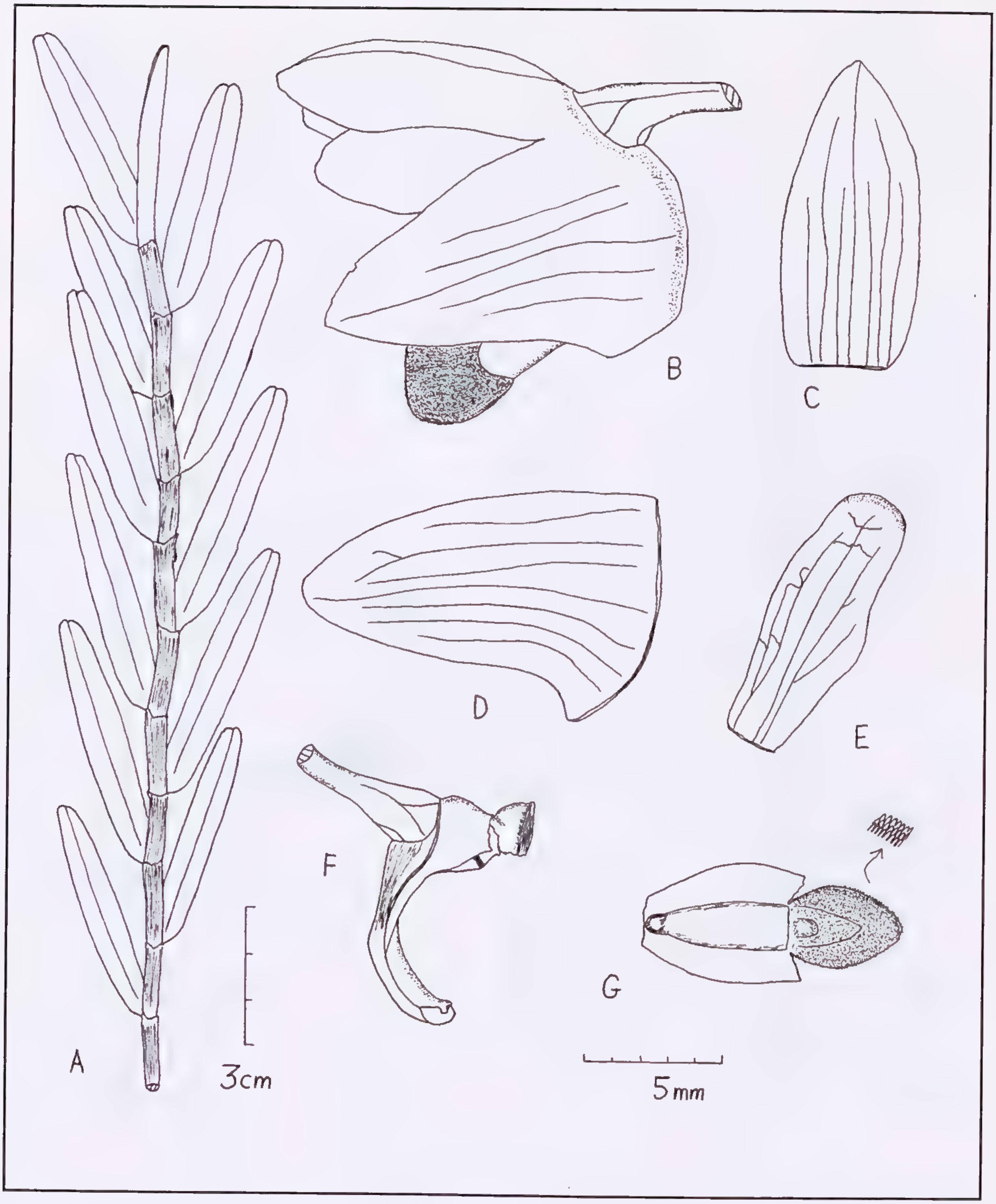


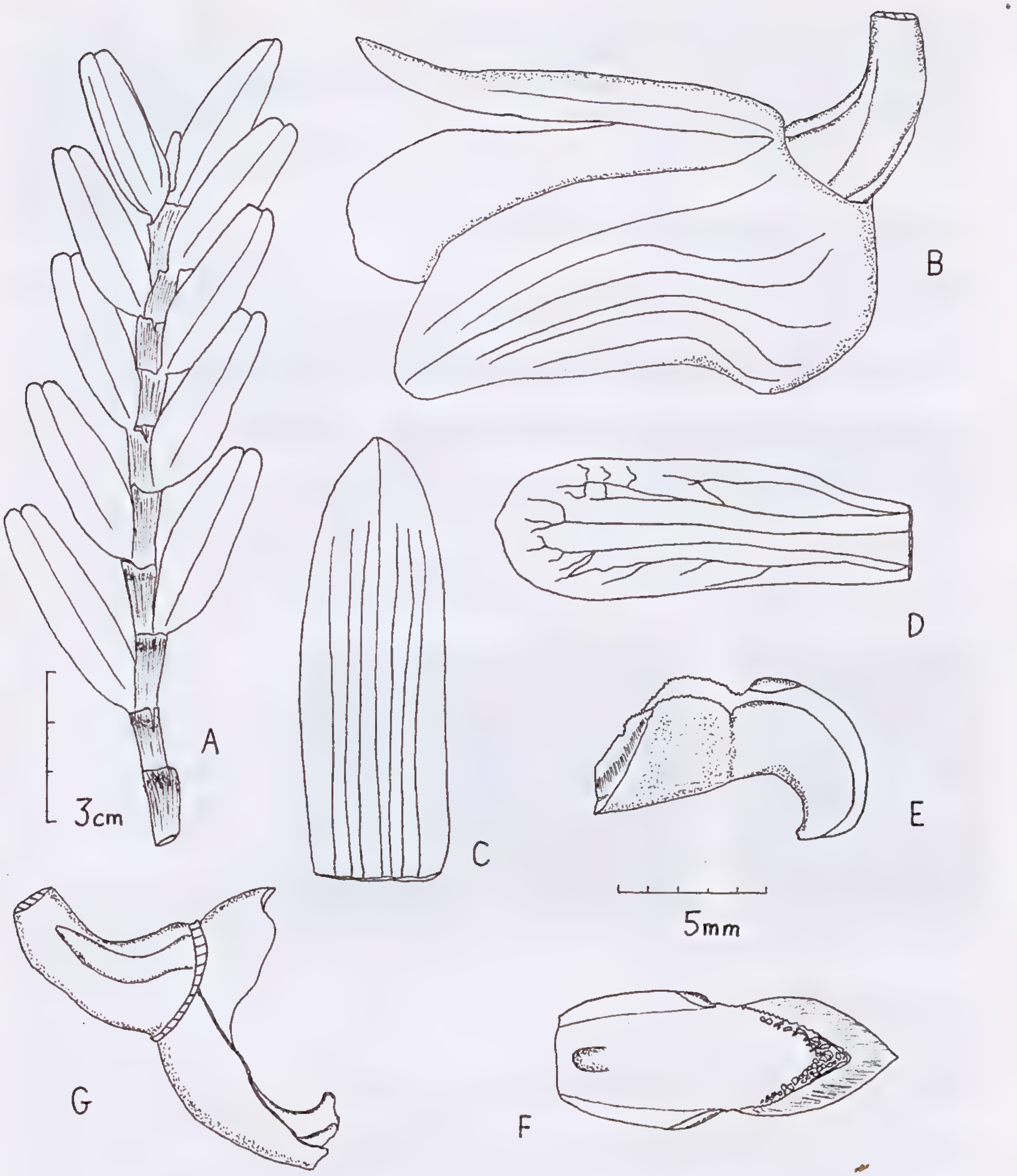
Dendrobium aethalodes - A. upper part of stem; B. flower minus segments except one lateral sepal (cross-section of ovary arrowed); C. dorsal sepal; D. petal; E. labellum (apex arrowed). A and B-E to respective scales. Drawn from holotype.



Dendrobium hooglandianum - A. upper part of stem; B. flower; C. dorsal sepal; D. lateral sepal; E. petal; F. labellum; G. flower minus segments. A and B-G to respective scales. Drawn from holotype.



Dendrobium hooveri - A. upper part of stem; B. flower; C. dorsal sepal; D. lateral sepal; E. petal; F. flower minus segments; G. labellum; (detail of papillae arrowed). A and B-G to respective scales. Drawn from holotype.



Dendrobium pullenianum - A. upper part of stem; B. flower; C. dorsal sepal; D. petal; E. labellum from side; F. labellum from above; G. flower minus segments; A and B-EG to respective scales; F. not to scales. Drawn from holotype.

AUSTRALASIAN NATIVE ORCHID SOCIETY
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Public viewing : 8.15 am – 9 am and 1 pm – 3 pm

Sarcochilus hartmannii

Dendrobium speciosum var. *blackdownense*

For further information:
Website: anosvic.org.au
David Brewster Ph. 9761 1100
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A.N.O.S. Geelong Group
Annual Spring Sarcochilus Show
3rd and 4th November, 2007
The Masonic CentreRegent St, Belmont, Geelong
Melways page 451 H 10

Southern Orchid Spectacular 2007

12th -14th October 2007
At **Sharkies**
Captain Cook Drive
Woolooware

BOONAH ORCHID SHOW PROMISES RARE TREAT

Orchid fanciers and the general public are in for a treat at the 11th Annual Boonah Orchid and Sarcochilus Show on October 20-21.

A wide variety of native orchids rarely seen will be included in both the orchid and Sarcochilus sections of the show to be held at the Boonah High School.

Included will be *Cymbidium canaliculatum*, *Dendrobium discolour* and hybrids as well as other rare species.

With 40 classes in the orchid section and 10 in the Sarcochilus competition of the show, entries are expected to attract competitors from across Queensland and northern New South Wales and present judges from the Australian Orchid Council with some tough decisions.

The Orchid Section will attract the Grand Champion prize as well as Reserve Champion and 10 minor awards with the Sarcochilus entries open to Champion and Reserve

There are four sections reserved for Australian native species.

Dinner for Two is the theme for the floral art component of the show which is also expected to draw general interest.

The Boonah Rotary Club is lending support to this year's event with a grand raffle to help raise funds for the High School Chaplaincy program and home made cakes, jams, preserves and sweets will be on sale as well as refreshments.

Inquiries should go to Dennis Stahlhut on 07 5464 6666.

NOSTI Shows 2007

Involving NOSTI, Toowoomba Orchid Soc., Darling Downs Orchid Society.
Walsh's Seeds and Garden Centre
881 Ruthven Street, Toowoomba 4350
3rd,4th,5th August 2007

Native Orchid Society of Toowoomba Inc.
Spring Show
Our Saviour's Lutheran Church Hall,
cnr West and Alderley STs.,
Toowoomba 4350
8th,9th September 2007

NOSTI Orchid Show featuring
Sarcochilus Orchids
Walsh's Seeds and Garden Centre
881 Ruthven St., Toowoomba
20th, 21st October 2007

MT. PENANG FLORA FESTIVAL & A.N.O.S. CENTRAL COAST GROUP SPRING SHOW

6th, 7th, 8th, 9th. SEPTEMBER
PACIFIC HIGHWAY
MT. PENANG, KARIONG

A.N.O.S. WARRINGAH GROUP SPRING SHOW

8th & 9th SEPTEMBER
STARKEY Street, FORESTVILLE

CENTRAL COAST A.N.O.S. SARCOCHILUS SHOW

20th & 21st OCTOBER
BUSHLAND NURSERY,
THE ENTRANCE ROAD, ERINA HEIGHTS

Devonport Orchid Society's Sarcochilus Show

Sunday the 11th of November
The Maidstone Park Memorial Hall
Spreyton
9am to 4pm

Calochilus pulchellus

This new species is currently being assessed by the New South Wales Scientific Committee as a Vulnerable Species under the NSW Threatened Species Conservation Act 1995. It has a history on the New South Wales South Coast dating back to at least 1959 when three individuals were discovered by well known orchid identity, Leo Cady. This was the first recorded occurrence and a single flower was sent to the Sydney Botanic Gardens for positive identification. This identification stated the species was *Calochilus grandiflorus* and all subsequent plants were afforded that name until the mid 1990's, when another small group was discovered west of Nowra by the late Ron Tunstall. From that time the specific name included the famous (infamous) sp. aff., as *C. pulchellus* was considered to be synonymous with *C. grandiflorus* at that time. With the dedicated work of the Centre for Plant Biodiversity Research (CPBR) over many years the number of orchids burdened with that inclusion has been steadily diminishing and a correct taxon, *Calochilus pulchellus,* has recently been applied. This data can be found in the most recent publication of the Australian Orchid Research, Vol 5. The true *Calochilus grandiflorus* was originally discovered in the freshwater marshes of an island in Moreton Bay (Queensland) during the voyage of H.M.A.S. Rattlesnake in 1847 and later was considered to occur as far south as Gosford in NSW.

A gap of over 40 years separated the Cady and Tunstall discoveries and despite searches of the Tunstall site by this author over four years, no plants have been located. This should not come as a surprise for this is a difficult species, usually found in flower in the season or two following a fire. However, further discoveries were made by the author along the Jervis Bay Road near Huskisson, on the NSW South Coast in 1999, 2003, 2004 and 2006. These latter finds have produced a mere 7 plants. The first find (one plant) has chosen not to flower since 1999, the second site contains four plants on a site planned for 604 homes next to a $60m Regional Shopping Centre and across the road from the 2001 find of *Rhizanthella slateri*. This impending action has prompted the Vulnerable Species nomination as it comprises 26% of known plants. The 2003 find is limited to four plants in an area of less than 10 sq m, with a further single plant (2006) located 150 m distant, in a tree stump. The 2003 discovery also produced a single specimen which was collected by David L Jones. This plant was located in the Booderee National Park at Jervis Bay during surveys for *Prasophyllum affine* and *Cryptostylis hunteriana*. This site is one of two earmarked for an Entrance/ Interpretive Centre to the National Park and despite the significance of the orchid, my bitter experience tells me a mercenary view is usually taken of anything which might stand in the way of a development.. A week or so later Dr. Mark Clements of the CPBR located the largest group (18 plants) at a site 40 km distant in a section of the Morton National Park.

With more favourable weather conditions in 2007 I would like to think this species would be better represented during its flowering season, which is from late October to late November. Plants produce up to five flowers on a stem to 300 mm and are limited to small areas in their preferred habitat which is "dense low heathland and wet heathland in well-drained to wet sand over sandstone". *C. grandiflorus* has larger flowers and is more floriferous. Indications are of no genetic diversity between populations and I have not noted and juvenile non flowering plants thus far.

The lots on the housing developments are expected to be on sale for $200,000 plus and as the plants occur on two lots, their current nuisance value to the developer is at least $400,000. In this light I ask all concerned orchid lovers to monitor the outcome of this species when a determination is made later in 2007 and submit comments during the period reserved for public exhibition and comment.

Alan Stephenson
National Conservation Officer
Australasian Native Orchid Society (ANOS)

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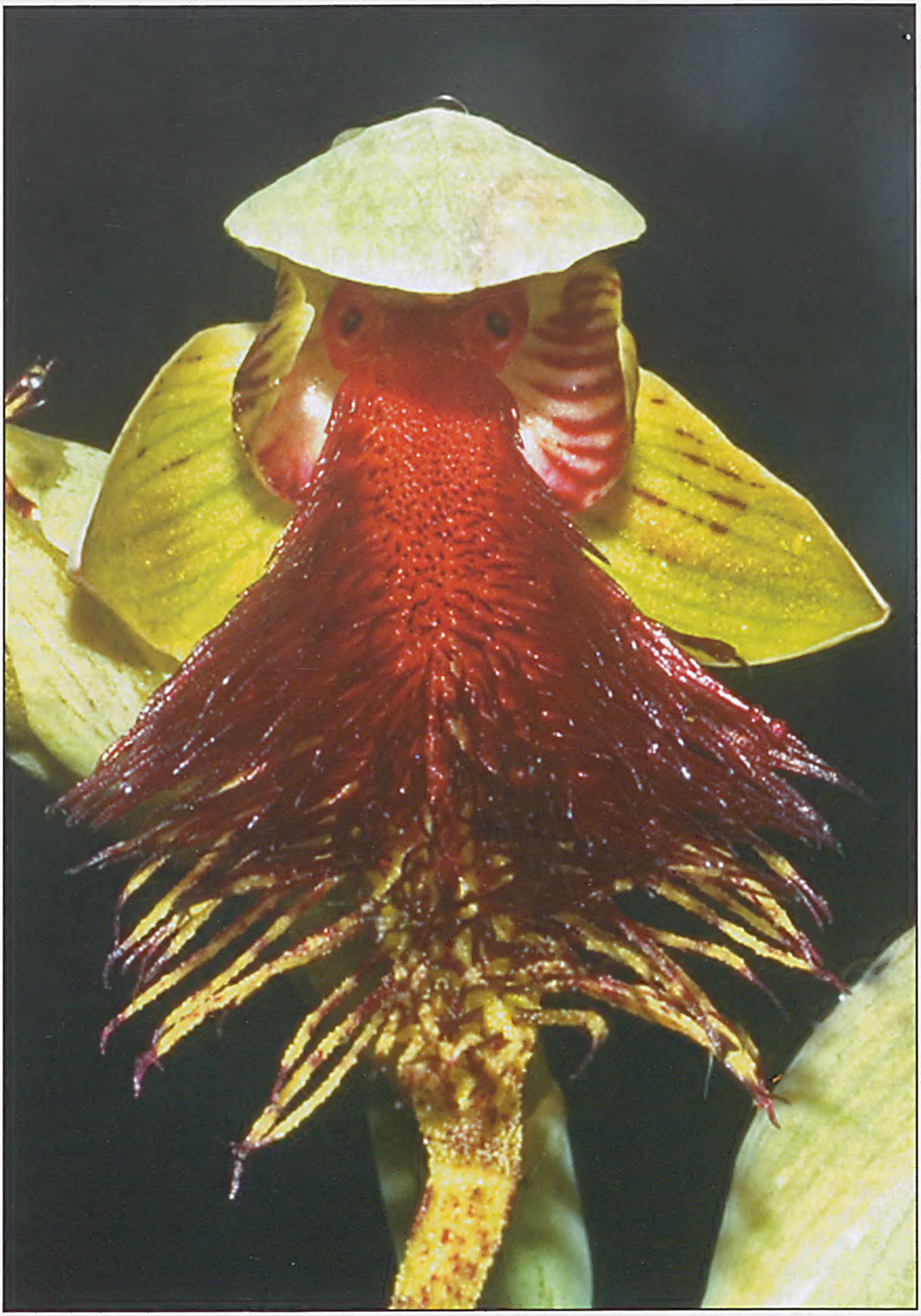

Calochilus pulchellus

Photo Alan Stephenson

Orchid seed storage into the future.

By Jessica Soanes (PhD student – Kings Park & Botanic Garden)
Jessica.Soanes@bgpa.wa.gov.au.

Beautiful, fascinating and delicate are just some of the words people use to describe orchids. Although we are able to enjoy the colourful display of these lovely plants, many species are threatened with extinction and may not be around in the years to come. It is therefore vital that we determine how to conserve orchids to ensure they can be enjoyed by future generations.

Seedbanks allow seeds to be stored for up to hundreds of years so they can be used in future conservation and restoration programs. Most seeds are dried and stored at -18°C to maintain viability; however each species is unique and sometimes other storage environments such as cryostorage in liquid nitrogen are a better alternative. Considering the popularity of orchids in horticulture and the medicinal and religious uses of many species, it is surprising that there has been very little research into orchid seed storage. Research involving native Australian orchids is particularly lacking.

To address this lack of knowledge, a project supported by the Australian Orchid Foundation (AOF) is currently underway at Kings Park & Botanic Garden in Perth, Western Australia. This project will determine the storage conditions that best maintain the viability of Australian orchid seeds and will indicate whether conventional seedbank conditions are appropriate for long-term storage of Australian orchid seeds. This will enable guidelines for orchid seed storage to be developed that will allow seeds to remain viable when stored for long periods.

Ten species of terrestrial orchids, including three species of *Caladenia*, two species each of *Diuris, Pterostylis* and *Thelymitra*, and one species of *Microtis*, have been selected for the study. Seeds of these species were dried to a range of water contents and stored at temperatures of 23°C, 5°C, -18°C, -80°C and -196°C. The seeds will remain in storage for up to two years, with samples removed periodically and subjected to germination testing to determine viability. By doing this we can identify the storage conditions that reduce seed viability and those that maintain viability for the period of the study. These results can then be used to construct guidelines for the long-term storage of Australian orchid seeds.

So far the seeds have been in storage for fifteen months and although the project is still running it has become apparent that all seeds lose viability when they are stored with high water contents. Therefore, it appears that drying the seeds to an appropriate water content prior to storage is a key requirement for the successful maintenance of viability. The response of each species to the different storage conditions is unique though some generalizations can be made for each genera. Once dried, seeds of seven from the ten species studied remained viable when stored at -18°C, including the species of *Caladenia* and *Thelymitra*. This indicates that the conventional seedbank temperature of -18°C is appropriate for the long-term storage of these species, and possibly genera.

Orchid seeds may be particularly susceptible to deterioration when stored at -196°C in liquid nitrogen. Seven of the ten species studied lost viability during storage at this temperature, suggesting that the seeds may be injured by the freezing and/or thawing process. Of these, both *Pterostylis* species were successfully maintained at -80°C so this temperature may be best for the long-term storage of this genera.

Whether seed viability can be maintained during storage depends greatly on how the seeds are stored, however the length of time that viability can be maintained also depends on the species. A parallel study being carried out at Kings Park & Botanic Garden aims to determine which orchid species produce long-lived seeds and which produce short-lived seeds. By storing seeds of a large number of orchid species under conditions that promote aging (ie. high temperature and moisture levels) their longevity can be ranked relative to one another. By ranking longevity, seed processing can be prioritized such that short-lived species are stored as soon as possible after collection to avoid any viability loss.

To date, the seed longevity of fourteen orchid species have been ranked. We determined that all of the orchid seeds studied are extremely short-lived compared to other, non-orchid species. This means that it is vital that any orchid seeds collected for conservation are placed into conditions suitable for long-term storage as soon as possible. Exposing freshly collected seeds to warm temperatures and/or high humidity, even for a short period of time, is likely to impact significantly on their storage life. By studying a more extensive range of species it is hoped that a better understanding of orchid seed longevity may be obtained. Therefore, donations of freshly collected orchid seeds from readers, particularly seeds from epiphytic species, would be very much appreciated. Approximately half a tablespoon of seeds is required from each species and if you are able to donate please email Jessica.Soanes@bgpa.wa.gov.au.

With support from the Australian Orchid Foundation, scientists at Kings Park and Botanic Garden are performing the most comprehensive investigation yet, to determine the best storage conditions for Australian orchid seeds. This study will produce guidelines for storage of orchid seeds, enabling seeds to be conserved and used in future restoration programs, thus protecting these exquisite flowers from extinction and ensuring future generations will be able to enjoy their beauty.

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A.N.O.S. Geelong Group CELEBRATE 20 YEARS

At the meeting held on 13th June, 2007, we celebrated our clubs 20th anniversary with a party. Forty members came along to help celebrate this important occasion.

There are still about ten members still involved with the club who attended the inaugural meeting back in 1987. We invited Helen Richards to this meeting, who we can thank for getting the ball rolling way back then. Helen who at that time was President of ANOS Victorian Group said she had been prompted to expand the clubs in Victoria when the parent body in NSW said to her - "What!, only one ANOS group in Victoria"? Helen is still very involved with our group sending us all her spare tubers each year that we divide up amongst members. We can't express our thanks enough to her for her generosity.

We also invited other guests including Dick Thomson who runs a terrestrial study day for us each year, with the tubers Helen sends us. The President of the Victorian Group Andrew Dilley and his wife Sue, as well as their Secretary Alison Blackstock and Marion Thomson – Dick's wife, joined us too.

Our first President was Everett Foster who did a three year term in that position and at the following AGM was elected to the position as Secretary, a position he still holds today.

A few days before our meeting on 11th June 2007 we found in the Geelong Advertiser a heading under the Queen's Birthday honours list: OAM COMMUNITY SERVICE BLOSSOMS – On reading further it said and I quote:
"Belmont's Everett Foster is so well regarded within the orchid fraternity that he has a species of a flower named after him. Canberra scientists christened the *Prasophyllum fosterii* three years ago after Mr Foster sent a specimen of the previously undiscovered plant to their laboratory for examination."

As well as holding down the position as Secretary of our club, and Editor of our monthly newsletter, Everett also does orchid monitoring work for the Department of Sustainability and the Environment, plus has had an involvement in the National Wool Museum since 1989, (I'm not finished yet) he did 35 years with the Geelong Football Umpires League, and has been involved with his local church for over 20 years.

So we congratulate Everett on his achievement, we are all very proud of him, and will finish off with his quote,

"It's something you just do, without any thought of anything else. I say it's better to keep going"

Frances Wilde

Everett Foster, Helen Richards, Margaret Foster and Winston Huggins, all original members, about to blow out the candles.